Vol. 1132 Number 3

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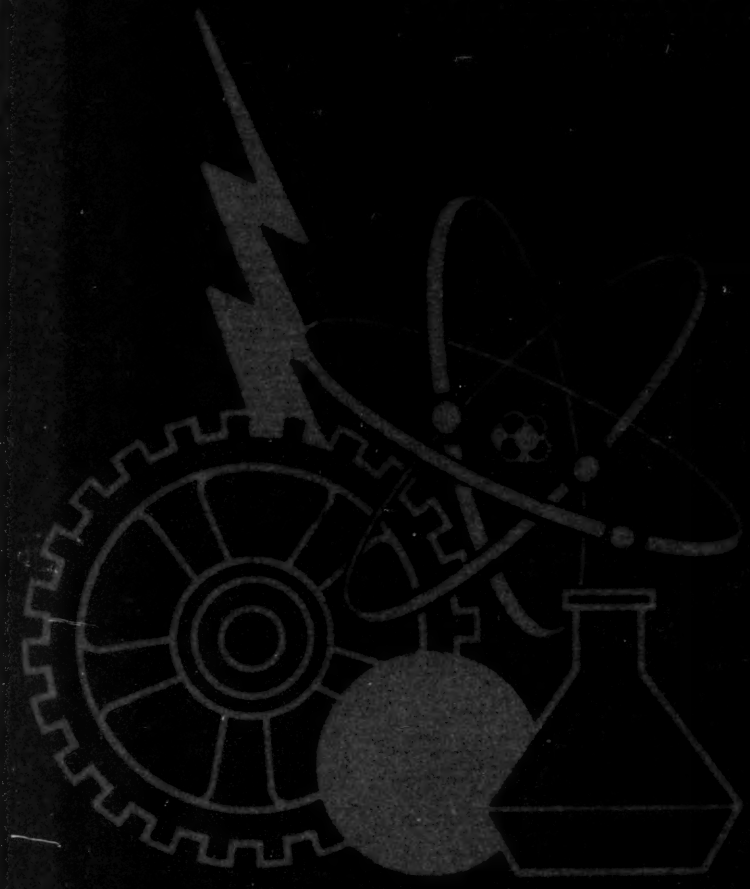
PATENTS

November 19, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	490.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	119.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	150.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

June 27, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on November 15, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,783,853 through 4,785,475
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 13, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,481,679 through 4,483,018
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 15, 1991 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,403,354	06/306,420	9/13/83
4,403,361	06/236,570	9/13/83
4,403,364	06/341,272	9/13/83
4,403,376	06/229,130	9/13/83
4,403,383	06/287,529	9/13/83
4,403,385	06/281,069	9/13/83
4,403,388	06/262,397	9/13/83
4,403,389	06/231,896	9/13/83
4,403,391	06/252,036	9/13/83
4,403,393	06/314,281	9/13/83
4,403,419	06/275,565	9/13/83
4,403,423	06/295,094	9/13/83
4,403,425	06/278,157	9/13/83
4,403,427	06/384,021	9/13/83
4,403,428	06/321,238	9/13/83
4,403,434	06/340,257	9/13/83
4,403,436	06/299,734	9/13/83
4,403,437	06/241,726	9/13/83
4,403,445	06/309,590	9/13/83
4,403,456	06/297,168	9/13/83
4,403,466	06/375,421	9/13/83
4,403,467	06/426,985	9/13/83
4,403,468	06/387,042	9/13/83
4,403,484	06/306,025	9/13/83
4,403,486	06/216,867	9/13/83
4,403,497	06/262,757	9/13/83
4,403,498	06/283,297	9/13/83
4,403,501	06/228,881	9/13/83
4,403,504	06/292,683	9/13/83
4,403,508	06/272,227	9/13/83
4,403,517	06/270,541	9/13/83
4,403,524	06/289,725	9/13/83
4,403,525	06/216,248	9/13/83
4,403,528	06/278,042	9/13/83
4,403,530	06/224,032	9/13/83
4,403,531	06/242,626	9/13/83
4,403,533	06/286,229	9/13/83
4,403,535	06/222,157	9/13/83
4,403,536	06/276,256	9/13/83
4,403,537	06/292,729	9/13/83
4,403,539	06/261,484	9/13/83
4,403,540	06/364,445	9/13/83
4,403,557	06/386,307	9/13/83
4,403,565	06/242,625	9/13/83
4,403,579	06/295,557	9/13/83
4,403,582	06/277,818	9/13/83
4,403,588	06/274,187	9/13/83
4,403,590	06/285,413	9/13/83
4,403,597	06/225,662	9/13/83
4,403,603	06/260,261	9/13/83
4,403,608	06/248,495	9/13/83
4,403,619	06/255,460	9/13/83
4,403,622	06/402,790	9/13/83
4,403,624	06/305,697	9/13/83
4,403,634	06/244,834	9/13/83
4,403,640	06/282,728	9/13/83
4,403,649	06/316,828	9/13/83
4,403,651	06/298,353	9/13/83
4,403,652	06/249,855	9/13/83
4,403,655	06/236,318	9/13/83
4,403,661	06/252,283	9/13/83
4,403,663	06/253,106	9/13/83
4,403,665	06/262,650	9/13/83
4,403,667	06/289,211	9/13/83
4,403,671	06/266,056	9/13/83
4,403,678	06/316,813	9/13/83
4,403,680	06/225,433	9/13/83
4,403,685	06/221,049	9/13/83
4,403,688	06/260,980	9/13/83
4,403,698	06/255,754	9/13/83
4,403,711	06/324,014	9/13/83
4,403,717	06/341,931	9/13/83
4,403,718	06/312,132	9/13/83
4,403,728	06/377,539	9/13/83
4,403,729	06/402,019	9/13/83
4,403,738	06/373,296	9/13/83
4,403,745	06/307,987	9/13/83
4,403,749	06/241,240	9/13/83
4,403,751	06/290,085	9/13/83
4,403,753	06/281,563	9/13/83
4,403,758	06/307,113	9/13/83
4,403,761	06/222,383	9/13/83
4,403,770	06/360,190	9/13/83

Patent Number	Serial Number	Issue Date
4,403,772	06/302,316	9/13/83
4,403,775	06/388,092	9/13/83
4,403,777	06/223,537	9/13/83
4,403,780	06/283,626	9/13/83
4,403,781	06/304,622	9/13/83
4,403,789	06/329,320	9/13/83
4,403,800	06/257,119	9/13/83
4,403,801	06/277,753	9/13/83
4,403,803	06/261,644	9/13/83
4,403,809	06/314,340	9/13/83
4,403,817	06/246,326	9/13/83
4,403,823	06/240,901	9/13/83
4,403,831	06/301,114	9/13/83
4,403,840	06/241,781	9/13/83
4,403,843	06/360,553	9/13/83
4,403,849	06/332,353	9/13/83
4,403,855	06/349,927	9/13/83
4,403,886	06/355,111	9/13/83
4,403,887	06/269,736	9/13/83
4,403,889	06/271,520	9/13/83
4,403,894	06/232,472	9/13/83
4,403,895	06/269,345	9/13/83
4,403,899	06/269,563	9/13/83
4,403,900	06/225,713	9/13/83
4,403,912	06/246,657	9/13/83
4,403,918	06/340,774	9/13/83
4,403,925	06/289,752	9/13/83
4,403,931	06/343,237	9/13/83
4,403,935	06/247,810	9/13/83
4,403,946	06/309,426	9/13/83
4,403,956	06/282,737	9/13/83
4,403,960	06/357,274	9/13/83
4,403,964	06/308,902	9/13/83
4,403,969	06/236,208	9/13/83
4,403,971	06/260,168	9/13/83
4,403,973	06/270,288	9/13/83
4,403,977	06/249,837	9/13/83
4,403,986	06/368,157	9/13/83
4,403,987	06/342,150	9/13/83
4,403,995	06/350,116	9/13/83
4,403,997	06/334,538	9/13/83
4,403,998	06/334,159	9/13/83
4,404,001	06/414,270	9/13/83
4,404,003	06/312,061	9/13/83
4,404,006	06/275,279	9/13/83
4,404,007	06/328,797	9/13/83
4,404,010	06/317,704	9/13/83
4,404,015	06/281,531	9/13/83
4,404,018	06/391,088	9/13/83
4,404,022	06/334,897	9/13/83
4,404,025	06/351,530	9/13/83
4,404,039	06/373,295	9/13/83
4,404,053	06/217,202	9/13/83
4,404,057	06/300,197	9/13/83
4,404,059	06/382,407	9/13/83
4,404,060	06/370,352	9/13/83
4,404,062	06/360,646	9/13/83
4,404,091	06/314,939	9/13/83
4,404,096	06/326,459	9/13/83
4,404,108	06/300,299	9/13/83
4,404,111	06/232,456	9/13/83
4,404,122	06/360,075	9/13/83
4,404,123	06/449,913	9/13/83
4,404,126	06/278,668	9/13/83
4,404,129	06/221,376	9/13/83
4,404,133	06/272,979	9/13/83
4,404,134	06/352,954	9/13/83
4,404,138	06/391,197	9/13/83
4,404,149	06/383,935	9/13/83
4,404,154	06/326,088	9/13/83
4,404,168	06/295,562	9/13/83
4,404,177	06/320,235	9/13/83
4,404,181	06/311,682	9/13/83
4,404,197	06/264,096	9/13/83
4,404,198	06/233,767	9/13/83
4,404,201	06/321,021	9/13/83
4,404,202	06/337,103	9/13/83
4,404,203	06/263,643	9/13/83
4,404,215	06/322,513	9/13/83
4,404,220	06/287,839	9/13/83
4,404,227	06/268,701	9/13/83
4,404,230	06/254,546	9/13/83
4,404,231	06/321,027	9/13/83
4,404,233	06/224,743	9/13/83
4,404,242	06/364,748	9/13/83
4,404,245	06/263,599	9/13/83
4,404,255	06/255,622	9/13/83
4,404,261	06/310,555	9/13/83
4,404,264	06/228,633	9/13/83
4,404,272	06/351,479	9/13/83
4,404,275	06/396,571	9/13/83
4,404,281	06/409,765	9/13/83
4,404,282	06/409,764	9/13/83
4,404,297	06/456,34-	9/13/83
4,404,301	06/370,900	9/13/83
4,404,348	06/406,991	9/13/83
4,404,357	06/374,054	9/13/83
4,404,359	06/399,211	9/13/83
4,404,363	06/371,532	9/13/83
4,404,364	06/371,346	9/13/83
4,404,367	06/296,566	9/13/83
4,404,389	06/403,118	9/13/83
4,404,392	06/321,498	9/13/83
4,404,394	06/318,980	9/13/83
4,404,398	06/324,747	9/13/83
4,404,420	06/292,937	9/13/83
4,404,422	06/302,650	9/13/83
4,404,431	06/322,684	9/13/83
4,404,444	06/345,620	9/13/83
4,404,447	06/252,330	9/13/83
4,404,457	06/372,397	9/13/83
4,404,460	06/357,404	9/13/83
4,404,463	06/331,730	9/13/83
4,404,488	06/338,932	9/13/83
4,404,492	06/295,878	9/13/83
4,404,494	06/253,566	9/13/83
4,404,498	06/240,798	9/13/83
4,404,502	06/328,481	9/13/83
4,404,504	06/245,372	9/13/83
4,404,507	06/324,671	9/13/83
4,404,518	06/256,795	9/13/83
4,404,522	06/262,848	9/13/83
4,404,535	06/339,041	9/13/83
4,404,540	06/367,757	9/13/83
4,404,541	06/279,014	9/13/83
4,404,547	06/270,417	9/13/83
4,404,558	06/254,453	9/13/83
4,404,598	06/223,545	9/13/83
4,404,609	06/315,592	9/13/83
4,404,615	06/330,432	9/13/83
4,404,621	06/300,934	9/13/83
4,404,623	06/371,443	9/13/83
4,404,637	06/258,969	9/13/83
4,404,640	06/238,710	9/13/83
4,404,644	06/263,516	9/13/83
4,404,650	06/228,959	9/13/83
4,404,658	06/266,069	9/13/83
4,404,664	06/221,733	9/13/83
4,404,666	06/269,171	9/13/83
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4,692,955	06/885,411	9/15/87
4,692,956	06/815,214	9/15/87
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4,693,021	06/781,817	9/15/87
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4,693,026	06/899,376	9/15/87
4,693,031	06/694,055	9/15/87
4,693,032	06/813,677	9/15/87
4,693,034	06/774,580	9/15/87
4,693,047	06/880,592	9/15/87
4,693,059	06/835,042	9/15/87
4,693,068	06/870,998	9/15/87
4,693,071	06/811,747	9/15/87
4,693,086	06/787,106	9/15/87
4,693,088	06/890,480	9/15/87
4,693,090	06/919,469	9/15/87
4,693,093	06/880,916	9/15/87
4,693,094	06/863,776	9/15/87
4,693,096	06/939,039	9/15/87
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4,693,129	06/624,317	9/15/87
4,693,133	06/499,879	9/15/87
4,693,136	06/903,931	9/15/87
4,693,137	06/827,129	9/15/87
4,693,140	06/925,529	9/15/87
4,693,144	06/904,826	9/15/78
4,693,149	06/740,958	9/15/87
4,693,150	06/749,630	9/15/87
4,693,152	06/871,334	9/15/87
4,693,154	06/858,819	9/15/87
4,693,155	06/856,656	9/15/87
4,693,163	06/893,199	9/15/87
4,693,164	06/870,063	9/15/87
4,693,166	06/757,810	9/15/87
4,693,180	06/908,373	9/15/87
4,693,184	06/839,966	9/15/87
4,693,185	06/831,678	9/15/87
4,693,186	06/903,228	9/15/87
4,693,195	06/871,020	9/15/87
4,693,200	06/802,429	9/15/87
4,693,202	06/789,488	9/15/87
4,693,204	06/922,485	9/15/87
4,693,205	06/835,180	9/15/87
4,693,209	06/886,462	9/15/87
4,693,212	06/825,346	9/15/87
4,693,228	06/829,348	9/15/87
4,693,229	06/836,698	9/15/87
4,693,231	06/799,539	9/15/87
4,693,234	06/827,977	9/15/87
4,693,241	06/887,446	9/15/87
4,693,247	06/912,959	9/15/87
4,693,254	06/910,271	9/15/87
4,693,263	06/836,313	9/15/87
4,693,269	06/874,848	9/15/87
4,693,273	06/718,444	9/15/87
4,693,275	06/936,636	9/15/87
4,693,277	06/625,802	9/15/87
4,693,279	06/827,227	9/15/87
4,693,282	06/854,845	9/15/87
4,693,290	06/472,907	9/15/87
4,693,294	06/843,745	9/15/87
4,693,313	06/878,996	9/15/87
4,693,318	06/786,050	9/15/87
4,693,320	06/895,007	9/15/87
4,693,329	06/676,243	9/15/87
4,693,335	06/800,748	9/15/87
4,693,336	06/894,756	9/15/87
4,693,337	06/812,549	9/15/87
4,693,340	06/781,695	9/15/87
4,693,344	06/704,493	9/15/87
4,693,345	06/887,268	9/15/87
4,693,346	06/758,226	9/15/87
4,693,347	06/839,259	9/15/87
4,693,355	06/796,742	9/15/87
4,693,367	06/909,627	9/15/87
4,693,375	06/800,653	9/15/87
4,693,377	06/902,092	9/15/87
4,693,378	06/779,619	9/15/87
4,693,380	06/943,888	9/15/87
4,693,385	06/731,088	9/15/87
4,693,386	06/820,777	9/15/87
4,693,394	06/694,414	9/15/87
4,693,400	06/769,570	9/15/87
4,693,402	06/820,014	9/15/87
4,693,412	06/773,793	9/15/87
4,693,414	06/904,968	9/15/87
4,693,422	06/912,665	9/15/87
4,693,425	06/864,331	9/15/87
4,693,431	06/815,013	9/15/87
4,693,434	06/779,228	9/15/87
4,693,437	06/659,943	9/15/87
4,693,438	06/827,426	9/15/87
4,693,439	06/836,972	9/15/87
4,693,440	06/882,690	9/15/87
4,693,441	06/715,355	9/15/87
4,693,442	06/879,434	9/15/87
4,693,449	06/790,864	9/15/87
4,693,455	06/738,165	9/15/87
4,693,457	06/904,862	9/15/87
4,693,458	06/934,194	9/15/87
4,693,466	06/789,439	9/15/87
4,693,469	06/927,399	9/15/87
4,693,474	06/747,852	9/15/87
4,693,480	06/746,130	9/15/87
4,693,487	06/794,074	9/15/87
4,693,490	06/923,149	9/15/87
4,693,492	06/846,687	9/15/87
4,693,496	06/894,169	9/15/87
4,693,498	06/856,308	9/15/87
4,693,504	07/001,170	9/15/87
4,693,505	06/851,468	9/15/87
4,693,508	06/912,056	9/15/87
4,693,509	06/845,260	9/15/87
4,693,512	06/915,052	9/15/87
4,693,516	06/896,430	9/15/87
4,693,524	06/686,746	9/15/87
4,693,531	06/660,276	9/15/87
4,693,551	06/539,344	9/15/87
4,693,564	06/793,127	9/15/87
4,693,573	06/838,111	9/15/87
4,693,590	06/765,821	9/15/87
4,693,599	06/837,644	9/15/87
4,693,624	06/753,666	9/15/87
4,693,627	06/876,155	9/15/87
4,693,630	06/661,439	9/15/87
4,693,633	06/669,636	9/15/87
4,693,636	06/221,594	9/15/87
4,693,647	06/795,328	9/15/87
4,693,650	06/846,883	9/15/87
4,693,651	06/902,634	9/15/87
4,693,660	06/813,092	9/15/87
4,693,664	06/638,032	9/15/87
4,693,667	06/390,872	9/15/87
4,693,679	06/795,690	9/15/87
4,693,681	06/887,354	9/15/87
4,693,686	06/829,725	9/15/87
4,693,687	06/839,734	9/15/87
4,693,692	06/898,290	9/15/87
4,693,696	06/822,787	9/15/87
4,693,716	06/643,030	9/15/87
4,693,726	06/847,722	9/15/87
4,693,729	06/825,628	9/15/87
4,693,730	06/889,795	9/15/87
4,693,769	06/725,868	9/15/87
4,693,774	06/863,603	9/15/87
4,693,780	06/808,144	9/15/87
4,693,802	06/725,188	9/15/87
4,693,805	06/829,190	9/15/87
4,693,818	06/663,184	9/15/87
4,693,819	06/939,171	9/15/87
4,693,820	06/750,467	9/15/87
4,693,827	06/841,636	9/15/87
4,693,830	06/779,345	9/15/87
4,693,841	06/802,888	9/15/87
4,693,860	06/898,036	9/15/87
4,693,871	06/849,808	9/15/87

4,693,875	06/900,863	9/15/87	4,694,194	06/794,920	9/15/87
4,693,889	06/806,877	9/15/87	4,694,200	06/833,734	9/15/87
4,693,892	06/904,733	9/15/87	4,694,201	06/728,715	9/15/87
4,693,900	06/765,865	9/15/87	4,694,209	06/743,024	9/15/87
4,693,917	06/796,221	9/15/87	4,694,211	06/870,100	9/15/87
4,693,919	06/739,928	9/15/87	4,694,212	06/842,623	9/15/87
4,693,950	06/792,901	9/15/87	4,694,217	06/789,777	9/15/87
4,693,958	06/695,259	9/15/87	4,694,227	06/851,230	9/15/87
4,693,961	06/849,994	9/15/87	4,694,231	06/853,637	9/15/87
4,693,967	06/235,510	9/15/87	4,694,240	06/875,954	9/15/87
4,693,977	06/820,930	9/15/87	4,694,245	06/648,786	9/15/87
4,693,982	06/736,667	9/15/87	4,694,247	06/741,812	9/15/87
4,693,993	06/744,207	9/15/87	4,694,256	06/699,176	9/15/87
4,694,005	06/854,479	9/15/87	4,694,265	06/631,021	9/15/87
4,694,015	06/797,486	9/15/87	4,694,290	06/699,022	9/15/87
4,694,029	06/721,395	9/15/87	4,694,292	06/683,476	9/15/87
4,694,039	06/927,595	9/15/87	4,694,305	06/846,590	9/15/87
4,694,047	06/927,921	9/15/87	4,694,333	06/777,840	9/15/87
4,694,052	06/748,480	9/15/87	4,694,362	06/648,227	9/15/87
4,694,053	06/748,433	9/15/87	4,694,367	06/798,795	9/15/87
4,694,084	06/709,871	9/15/87	4,694,369	06/711,742	9/15/87
4,694,085	06/843,084	9/15/87	4,694,379	06/689,211	9/15/87
4,694,097	06/856,665	9/15/87	4,694,380	06/873,000	9/15/87
4,694,105	06/679,860	9/15/87	4,694,381	06/835,382	9/15/87
4,694,106	06/837,145	9/15/87	4,694,409	06/623,871	9/15/87
4,694,120	06/793,872	9/15/87	4,694,420	06/814,152	9/15/87
4,694,127	06/877,062	9/15/87	4,694,437	06/759,261	9/15/87
4,694,132	06/921,962	9/15/87	4,694,457	06/813,452	9/15/87
4,694,141	06/925,156	9/15/87	4,694,468	06/855,562	9/15/87
4,694,148	06/751,946	9/15/87	4,694,479	06/728,499	9/15/87
4,694,153	06/792,450	9/15/87	4,694,484	06/830,145	9/15/87
4,694,159	06/899,013	9/15/87	4,694,489	06/884,213	9/15/87
4,694,160	06/823,671	9/15/87	4,694,496	06/491,581	9/15/87
4,694,172	06/786,915	9/15/87	4,694,499	06/701,387	9/15/87
4,694,176	06/818,059	9/15/87	4,694,503	06/841,812	9/15/87

Errata

In the list of patents which expired on Sept. 1, 1991, due to failure to pay maintenance fees, in the O.G. of Nov. 12, 1991 the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,690,348	06/780,592	9/01/87	9/26/85

In the list of patents which expired on June 9, 1991, due to failure to pay maintenance fees, in the O.G. of Aug. 20, 1991 the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,671,402	06/715,451	6/09/87	3/25/85

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,548,689, Re. S.N. 07/770,528, Filed Oct. 3, 1991, Cl. 204/159.23, PHOTOCURABLE RESIN COMPOSITION, Sakashita Takeshi, et. al., Owner of Record: *Mitsui Petrochemical Industries Ltd., Tokyo, Japan*, Attorney or Agent: Mathew Jacob, Ex. Gp.: 112

4,599,285, Re. S.N. 07/773,974, Filed Oct. 8, 1991, Cl. 430, MULTIPLEX IMAGE REPRODUCING METHOD, Satoshi Haneda, et. al., Owner of Record: *Konica Corp., Tokyo, Japan*, Attorney or Agent: Jordon B. Bierman, Ex. Gp.: 157

4,758,362, Re. S.N. 07/770,459, Filed Sept. 25, 1991, Cl. 252/047.005, CARBAMATE ADDITIVES FOR LOW PHOSPHORUS OR PHOSPHORUS FREE LUBRICATING COMPOSITIONS, Betsy J. Butke, Owner of Record: *The Lubrizol Corp., Wickliffe, Ohio*, Attorney or Agent: Neil A. DuChez, Ex. Gp.: 118

4,775,590, Re. S.N. 07/772,429, Filed Oct. 7, 1991, Cl. 428/373, OPTICAL FIBER, Teruo Sakagami, et. al., Owner of Record: *Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: James C. Wray, Ex. Gp.: 150

4,792,813, Re. S.N. 07/771,905, Filed Oct. 4, 1991, Cl. 343/781P, ANTENNA SYSTEM FOR HYBRID COMMUNICATIONS SATELLITE, Harold A. Rosen, Owner of Record: *Hughes Aircraft Co., Los Angeles, Calif.*, Attorney or Agent: Gordon R. Lindeen III, Ex. Gp.: 258

4,805,417, Re. S.N. 07/768,022, Filed Sept. 30, 1991, Cl. 62/292, DISPENSING TOOL ASSEMBLY FOR CHARGING A REFRIGERANT INTO A SYSTEM, Kim A. Weaver, et. al., Owner of Record: *Production Control Units Inc., Dayton, Ohio*, Attorney or Agent: Alan F. Meckstroth, Ex. Gp.: 344

4,807,957, Re. S.N. 07/775,023, Filed Oct. 11, 1991, Cl. 606/73, LIGAMENT ANCHOR SYSTEM, E. Marlow Goble, Owner

of Record: *Inventor*, Attorney or Agent: M. Reid Russell, Ex. Gp.: 339

4,872,258, Re. S.N. 07/773,154, Filed Oct. 8, 1991, Cl. 29/740, PICK AND PLACE METHOD AND APPARATUS, Phillip A. Ragard, Owner of Record: *Universal Instruments Corp., Binghamton, N.Y.*, Attorney or Agent: Franklin D. Wolffe, Ex. Gp.: 326

4,872,399, Re. S.N. 07/771,342, Filed Oct. 4, 1991, Cl. 98/94.1, CONVERTIBLE FAN ASSEMBLY, David B. Chaney, Owner of Record: *W. B. Marvin Manufacturing Co., Urbana, Ohio*, Attorney or Agent: Roger S. Dybvig, Ex. Gp.: 344

4,874,604, Re. S.N. 07/774,024, Filed Oct. 8, 1991, Cl. 424/47, HAIRSPRAY WITH IMPROVED ADHESION/REMOVABILITY WASHING, John A. Sramek, Owner of Record: *S. C. Johnson & Son, Racine, Wash.*, Attorney or Agent: Richard E. Rakoczy, Ex. Gp.: 152

4,918,086, Re. S.N. 07/772,699, Filed Oct. 7, 1991, Cl. 546/264, 1-NITRO-2,2-DIAMINOETHYLENE DERIVATIVES, Laurenz Gsell, Owner of Record: *Ciba-Geigy Corp.*, Ardsley, N.Y., Attorney or Agent: Bruce M. Collins, Ex. Gp.: 123

5,021,586, Re. S.N. 07/775,024, Filed Oct. 11, 1991, Cl. 548/527, DITHIOPHENLPYRROLE DERIVATIVE MONOMERS FOR PREPARING SEMI-CONDUCTING POLYMERS, James P. Albarella, et. al., Owner of Record: *Miles Inc., Elkhart, Ind.* Attorney or Agent: Jerome L. Jeffers, Ex. Gp.: 121

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,622,631, Reexam No. 90/002,471, Requested Oct. 8, 1991, Cl. 364/200, DATA PROCESSING SYSTEM HAVING A DATA COHERENCE SOLUTION, Steven J. Frank, et. al., Owner of Record: *Recognition Equipment Inc., Irving Tex.*, Attorney or Agent: Ross. Howison, Clapp & Korn, Richardson, Tex., Ex. Gp.: 232, Requster: Owner

4,710,528, Reexam No. 90/002,472, Requested Oct. 9, 1991, Cl. 524/100, FLAME RESISTANT THERMOPLASTIC POLYMERIC COMPOSITIONS COMPRISING (1) MELAMINE BROMOHYDRATE AND (2) SB OR AS COMPOUND ENDOWED WITH IMPROVED FLAME-RESISTANCE, Guido Bertelli, et. al., Owner of Record: *Himont Inc., Wilmington, Del.*, Attorney or Agent: Sharon A. Gibson, Himont Inc., Wilmington, Del., Ex. Gp.: 150, Requester: Owner

4,710,940, Reexam No. 90/002,473, Requested Oct. 10, 1991, Cl. 372/075, METHOD AND APPARATUS FOR EFFICIENT OPERATION OF OPTICALLY PUMPED LASER, Donald L. Sipes, Owner of Record: *California Institute of Technology, Pasadena, Calif.*, Attorney or Agent: A. M. Fernandez, Los Angeles, Calif., Ex. Gp.: 251, Requester: Shugrue, Mion, Zinn, MacPeak & Seas, Washington, DC

4,959,798, Reexam No. 90/002,474, Requested Oct. 11, 1991, Cl. 364/513, ROBOTIC TELEVISION-CAMERA DOLLY SYSTEM, Gary B. Gordon, et. al., Owner of Record: *Total Spectrum Manufacturing, Inc., Valley Cottage, N.Y.*, Attorney or Agent: Spencer & Frank, Washington, DC, Ex. Gp.: 238, Requester: Vinten Broadcast, Towaco, N.J.

4,990,896, Reexam No. 90/002,476, Requested Oct. 15, 1991, Cl. 340/641, LIGHT RESPONSIVE DEVICE FOR MONITORING ON-LINE INDICATOR LIGHTS, William F. Gray, Owner of Record: *Inventor, McLean, Va.*, Attorney or Agent: John P. Bundock, Leydig, Voit & Mayer, Washington, DC, Ex. Gp.: 268, Requester: Owner

5,008,804, Reexam No. 90/002,475, Requested Oct. 11, 1991, Cl. 364/167.01, ROBOTIC TELEVISION-CAMERA DOLLY SYSTEM, Gary B. Gordon, et. al., Owner of Record: *Total Spectrum Manufacturing, Inc., Valley Cottage, N.Y.*, Attorney or Agent: Spencer & Frank, Washington, DC, Ex. Gp.: 236, Requester: Vinten Broadcast, Towaco, N.J.

New Telephone Numbers for the Trademark Status Line

On November 18, 1991, the local telephone company in Arlington, Va. will change many of the telephone numbers used by the U.S. Patent and Trademark Office, including the numbers for the Trademark Status Line. Effective on that date, the new telephone numbers for the Trademark Status Line will be (703) 305-8747 through (703) 305-8752.

The Trademark Status Line provides access, via touch tone telephone, to current status and status date information for all federal trademark application and registration records maintained in the automated Trademark Reporting and Monitoring (TRAM) System. The Trademark Status Line is available from 6:30 a.m. until midnight, Eastern Time, Monday through Friday.

The Trademark Status Line may be used from any touch tone telephone by entering a seven-digit registration number and the "#" symbol or an eight-digit serial number and the "#" symbol after the welcoming message and the tone. All calls will be answered in the order received. Callers may request information for up to five serial number or registration number records per call. If additional information regarding the status of a trademark application or registration is required, call the Office of Trademark Services at (703) 308-9400 and request a status check.

Oct. 23, 1991

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Consideration of Fraud and Inequitable Conduct in Patent Interferences Cases

This notice supersedes the Commissioner's Notice of Oct. 17, 1988, *Further Clarification on Patent and Trademark Office Implementation of 37 CFR 1.56*, 1096 *Off. Gaz.* Patent Office 19 (Nov. 8, 1988), but not the Commissioner's Notice of Sept. 8, 1988, *Patent and Trademark Office Implementation of 37 CFR 1.56*, 1095 *Off. Gaz.* Patent Office 16 (Oct. 11, 1988).

Effective immediately, fraud and inequitable conduct issues will be considered when properly raised *inter partes* in patent interference cases. The policy of the Patent and Trademark Office with respect to investigation and resolution of fraud and inequitable conduct issues during *ex parte* examination of patent applications remains that of the Commissioner's Notice of Sept. 8, 1988.

The Chairman, the Vice-Chairman, an Examiner-in-Chief or a panel of the Board of Patent Appeals and Interferences, as may be appropriate, are authorized to determine the manner in which fraud and inequitable conduct can be raised in any interference pending before the Board at this time.

Oct. 24, 1991

HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner of Patents and Trademarks

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Notice of Resignation

Anthony D. Cennamo of Bidwell, Ohio, whose registration number is 16,430, has voluntarily resigned and surrendered his

registration as a patent attorney commencing Sept. 16, 1991. This action is taken under the provisions of 35 U.S.C. 32, and 37 CFR 10.130 and 10.133(b) and (g).

Oct. 22, 1991

CAMERON WEIFFENBACH
Director, Office of Enrollment and Discipline

Erratum

In the notice of adverse decisions in interference appearing at 1130 OG 7, of Sept. 3, 1991, delete all reference to Patent No. 4,741,662, since no final decision was rendered that the respective patentees are not entitled to the patent containing the claims listed.

Adverse Decision in Interference

In the designated interference involving the following patent, final decision has been rendered that the respective patentees are not entitled to the patent containing the claims listed.

Patent No. 4,741,622, Kyoichi Suwa, Masaichi Murakami, METHOD AND APPARATUS FOR DETECTING DIVERSION, Interference No. 102,276, decided Oct. 23, 1990, claims 1-20.

PATENT NOTICES

Certificates of Correction For Week of November 19, 1991

B 14,253,615	4,863,979	4,897,494	4,930,401
Re. 33,185	4,865,876	4,898,116	4,931,083
4,409,424	4,867,629	4,901,348	4,933,097
4,710,464	4,867,854	4,901,468	4,933,120
4,733,793	4,869,524	4,904,727	4,934,307
4,737,628	4,872,707	4,906,225	4,934,910
4,771,401	4,873,035	4,906,592	4,934,959
4,780,585	4,873,097	4,906,666	4,935,156
4,795,691	4,873,124	4,907,031	4,935,200
4,797,173	4,873,196	4,907,194	4,936,355
4,798,354	4,873,548	4,908,350	4,936,773
4,799,985	4,873,571	4,909,092	4,936,995
4,801,384	4,874,588	4,909,536	4,937,463
4,804,104	4,874,803	4,909,943	4,937,761
4,808,865	4,875,023	4,911,157	4,938,393
4,819,744	4,877,452	4,911,737	4,939,299
4,826,177	4,877,585	4,911,869	4,940,004
4,831,454	4,879,428	4,912,976	4,943,577
4,833,672	4,880,233	4,913,396	4,944,357
4,834,324	4,882,050	4,914,015	4,944,948
4,835,515	4,883,815	4,915,930	4,945,000
4,838,571	4,885,527	4,917,151	4,945,095
4,845,912	4,885,694	4,917,353	4,945,924
4,846,007	4,886,167	4,917,788	4,946,578
4,849,285	4,887,438	4,918,884	4,947,766
4,849,991	4,888,559	4,918,919	4,947,850
4,850,156	4,890,697	4,919,924	4,948,686
4,850,584	4,890,746	4,920,250	4,948,915
4,851,448	4,890,994	4,923,975	4,950,577
4,854,628	4,891,211	4,925,454	5,001,990
4,854,681	4,892,740	4,925,509	5,013,598
4,855,326	4,893,679	4,925,866	5,020,267
4,855,375	4,895,099	4,928,306	5,025,271
4,856,214	4,895,201	4,928,415	5,026,565
4,856,504	4,896,219	4,928,616	5,033,948
4,856,778	4,896,761	4,928,848	5,034,037
4,857,742	4,896,998	4,928,953	5,040,217
4,863,926	4,897,445	4,928,989	

Disclaimers

4,715,470—*Bjorn N. P. Paulsson*, Fullerton, Calif., DOWNHOLE ELECTROMAGNETIC SEISMIC SOURCE. Patent dated Dec. 29, 1987. Disclaimer filed July 15, 1991, by the assignee, Chevron Research and Technology Co.

The term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

4,755,444—*Kenichi Karakida; Shigeru Yagi*, both of Kanagawa, Japan. ELECTROPHOTOGRAPHIC PHOTO RECEPTOR. Patent dated July 5, 1988. Disclaimer filed Aug. 1, 1991, by the assignee, Fuji Xerox Co., Ltd.

Hereby enters this disclaimer to claims 1-13 of said patent.

4,904,785—*David W. Robertson; J. Scott Hayes*, both of Indianapolis, Ind., 2-PHENYLIMIDAZO[4,5-C]PYRIDINES. Patent dated Feb. 27, 1990. Disclaimer filed May 16, 1991, by the assignee, Eli Lilly and Co.,

Hereby enters this disclaimer to all claims of said patent.

5,005,861—*Allen K. Breed*, Boonton Township, Morris County; *Ted Thuen*, Morris Plains; *Carl T. Grossi*, Wharton, all of N.J., VELOCITY CHANGE SENSOR WITH DOUBLE POLES SENSOR. Patent dated April 9, 1991. Disclaimer filed Sept. 9, 1991, by the assignee, Breed Automotive Technology, Inc.

Hereby enters this disclaimer to claims 1-13 of said patent.

5,011,256—*Melvin H. Johnson*, Chadds Ford; *Leland L. Krauss*, Aston; *Dirk Landman*, Lancaster, all of Pa. PACKAGE FOR AN OPTOELECTRONIC COMPONENT. Patent dated April 30, 1991. Disclaimer filed Aug. 9, 1991, by the assignee, E. I. du Pont de Nemours and Co.

Hereby enters this disclaimer to the remaining term of said patent.

5,037,636—*Albert S. Chan*, St. Louis, Mo. FLUORIDE STABILITY IN DICALCIUM PHOSPHATE DIHYDRATE COMPOSITION. Patent dated Aug. 6, 1991. Disclaimer filed April 22, 1991, by the assignee, Monsanto Chemical Co.

The term of this patent subsequent to July 16, 2008, has been disclaimed.

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PATENT EXAMINING CORPS

JAMES E. DENNY, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
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GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	7/29/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	3/29/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — BARRY S. RICHMAN, Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	12/7/90
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*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during October 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,838,466 to 3,845,503 inclusive
Plant Patents ..... 3,628 to 3,643

REEXAMINATIONS

NOVEMBER 19, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,578,264 (1590th)

BOUNDARY LAYER CONTROL OF FLOW SEPARATION AND HEAT EXCHANGE

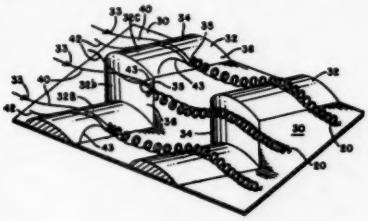
Arnold M. Kuethe, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, MI.

Reexamination Request Nos. 90/001,783, Jun. 12, 1989 and 90/001,966, Mar. 20, 1990.

Reexamination Certificate for Patent No. 3,578,264, issued May 11, 1971, Ser. No. 743,350, Jul. 9, 1968.

Int. Cl.[5] B64C *23/06*

U.S. Cl. 244—199



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **6**, **10** and **11–23** is confirmed.

Claims **1–5** and **7–9** are cancelled.

11. Vortex inducing apparatus in combination with a fluid control or flow directing surface for generating vortices by utilizing the energy represented by the boundary layer vorticity upstream of the apparatus so as to cause mixing of mainstream fluid with boundary layer fluid downstream of the apparatus, comprising at least one elongated flow diverting element arranged in superimposed relation with respect to said surface and having a height proportioned to extend partially into the boundary layer and having a length which is substantially greater than the upstream boundary layer thickness extending in a direction generally transversely but inclined at an angle other than 90° to said mainstream flow and being formed with a downstream surface defining a correspondingly transversely oriented concavity with said flow control surface in which the direction of flow of some of the streamlines closely adjacent said downstream surface is deflected to a greater extent than the streamlines in the boundary layer more remote from said downstream surface to generate rotation of said streamlines resulting in a trailing vortex substantially within the dimensions of the original upstream boundary layer.

B1 4,800,279 (1591st)

METHOD AND DEVICES FOR NEAR-INFRARED EVALUATION OF PHYSICAL PROPERTIES OF SAMPLES

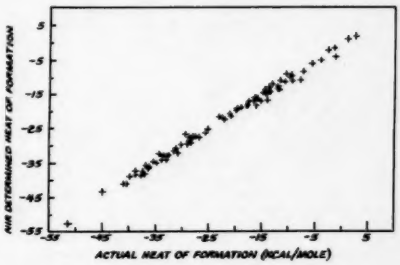
Gary M. Hieftje, Bloomington, Ind.; David E. Honigs, Brier, Wash., and Thomas B. Hirschfeld, Livermore, Calif., assignors to Indiana University Foundation, Bloomington, IN

Reexamination Request No. 90/002,064, Jun. 22, 1990.

Reexamination Certificate for Patent No. 4,800,279, issued Jan. 24, 1989, Ser. No. 776,133, Sep. 13, 1985.

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—339



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–23** having been finally determined to be unpatentable, are cancelled.

[**1**. A method for quantifying a physical property of a hydrocarbon sample, comprising the steps of:

(a) determining which wavelengths in the near-infrared spectrum correlate to the physical property to be quantified;

(b) determining weighting constants which are correlated to the determined wavelength;

(c) measuring the absorbance of the sample at each of the determined wavelengths; and

(d) calculating a reference value for the physical property from the measured absorbance of the smple as corrected by the weighting constant.]

REISSUES

NOVEMBER 19, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,744

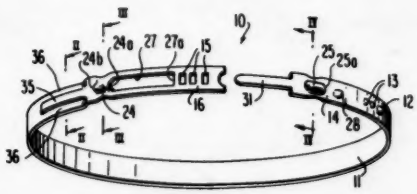
EARLESS CLAMP STRUCTURE

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker AG Maschinen- und Apparatefabrik, Horgen, Switzerland

Original No. 4,492,004, dated Jan. 8, 1985, Ser. No. 446,503, Dec. 3, 1982. Application for reissue Oct. 4, 1989, Ser. No. 417,046

Int. Cl.[5] B65D *63/02*

U.S. Cl. 24—20 R **46 Claims**



1. A clamp structure, especially for use in applications in which space conditions do not permit any projecting parts, such as plastically deformable ears, comprising clamping band means having open ends formed by an inner and outer band portion intended to overlap, and means mechanically interconnecting the overlapping open ends of the band means including outwardly extending hook means in the inner band portion operable to engage in aperture means in the outer band portion in the installed condition of the clamp structure, characterized in that the means mechanically interconnecting the open ends enable tightening of the band means about an object to be fastened and include tool-engaging means provided in the inner and outer band portions, said tool-engaging means being formed by pressed-out portions pressed-out of the inner and outer band portions and extending generally in the circumferential direction so that each pressed-out portion remains integral at least on both sides thereof with the respective band portion, whereby said tool-engaging means are able to withstand substantial forces in the circumferential direction without tearing which permit a secure tightening of the clamp structure about the object to be fastened without the use of any other tightening means in the clamp structure, *and in that the tool-engaging means in the inner band portion is located in the inner band portion on the side of the hook means nearer the free end of the inner band portion so that in the installed condition of the clamp structure it comes to lie on the side of the aperture means opposite the free end of the outer band portion.*

Re. 33,745

THIADIAZABICYCLONONANE DERIVATIVES, PROCESSES FOR THEIR PRODUCTION AND HERBICIDAL COMPOSITIONS

Mikio Yamaguchi, Shimada; Yukihiro Watase, Shizuoka; Takeshi Kambe, Tokyo, and Susumu Katou, Shizuoka, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd. and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

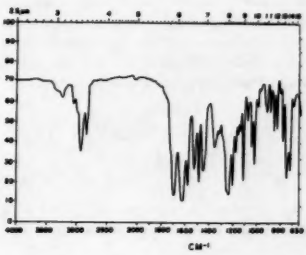
Original No. 4,816,063, dated Mar. 28, 1989, Ser. No. 910,978, Sep. 24, 1986. Application for reissue Aug. 15, 1989, Ser. No. 394,351

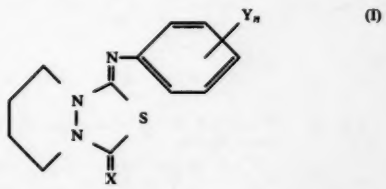
Claims priority, application Japan, Mar. 25, 1986, 61-66567

Int. Cl.[5] C07D *513/04*; A01N *43/82*

U.S. Cl. 71—90 **15 Claims**

1. A 9-phenylimino-8-thia-1,6-diazabicyclo[4.3.0]nonane-7-(one or thione) compound having the formula:

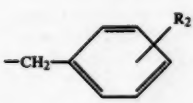




(I)

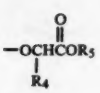
wherein Y which may be the same or different, represents chlorine, bromine, fluorine, hydroxyl, lower alkyl, lower alkoxy which may be substituted by chlorine, bromine or fluorine, lower alkenyloxy which may be substituted by chlorine, bromine or fluorine, lower alkynyloxy, phenoxy, lower cycloalkyloxy, lower alkoxycarbonyl-lower alkenyloxy, lower alkylthiocarbonyl-lower alkyloxy, lower alkynyloxycarbonyl-lower alkyloxy, benzyloxycarbonyl-lower alkyloxy, trifluoromethyl, benzyloxy which may be substituted by chlorine or lower alkyl, lower alkenyl, cyano-lower alkyl, lower alkylcarbamoyloxy, benzyl which may be substituted by one or two lower alkyl, lower alkoxy-lower alkyl, lower alkynyloxy-lower alkyl, lower cycloalkylmethyloxy which may be substituted by chlorine, bromine or fluorine, lower alkoxy-lower alkyloxy, phenethyloxy, lower cycloalkyloxycarbonyl-lower alkyloxy, pyrrolidinocarbonyl, phenylcarbonyl which may be substituted by lower alkyl,

wherein R_1 is hydrogen, lower alkyl, phenyl, lower cycloalkyl, lower alkoxy-lower alkyl, lower alkoxycarbonyl-lower alkyl or

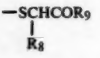


(wherein R_2 is hydrogen or lower alkoxy), X is oxygen or sulfur,

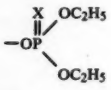
(wherein R_3 is lower alkyl, lower alkenyl or lower alkynyl, and m is 0 or 2),



wherein R_4 is hydrogen or lower alkyl, and R_5 is hydrogen, lower alkyl, lower alkoxy-lower alkyl, tetrahydrofurfuryl, lower alkoxy-lower alkyloxy-lower alkyl, lower alkoxycarbonyl-lower alkyl or $N{=}C(CH_3){-}R_6$ (wherein R_6 is lower alkyl or phenyl), $-NHR_7$ (wherein R_7 is lower alkylcarbonyl or lower alkoxycarbonyl-lower alkyl),



(wherein R_8 is hydrogen or lower alkyl, and R_9 is lower alkoxy, lower cycloalkyloxy or pyrrolidinyl), or



(wherein X is as defined above); n is an integer or from 0 to 3; and X is oxygen or sulfur.

Re. 33,746

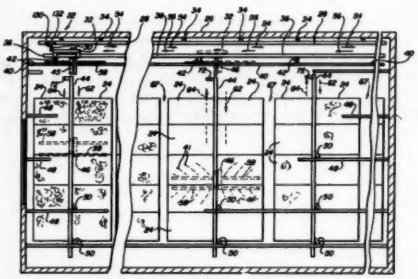
PROGRAMMABLE SPRINKLER SYSTEM

Gary H. Lucas, Hightstown, N.J., assignor to Integrated Tech Systems, Inc., Windsor, N.J.

Original No. 4,723,714, dated Feb. 9, 1988, Ser. No. 911,376, Sep. 25, 1986. Application for reissue Feb. 8, 1990, Ser. No. 477,323

Int. Cl.[5] A01G *25/09*

U.S. Cl. 239—744 **20 Claims**



18. A programmable spraying system comprising:

rail means;

car means movable along said rail means;

moving means operatively connected to said car means for moving said car means along said rail means;

fluid delivery means, extending between said car means and a source of fluid under pressure, for supplying to said car means a fluid under pressure;

electrical power supply means operatively connected to said car means for supplying electrical power to said car means and said moving means;

fluid dispensing means carried by said car means and connected to said fluid delivery means for dispensing fluid received from said fluid delivery means;

input means, disposed along a path defined by said rail means, for providing instructions as to an amount of said fluid to be delivered to an area along said path;

sensor means on said car means for detecting said instructions during motion of said car means along said rail means; and

programmable means operatively coupled to said sensor means and said car means for varying, while said car means moves along said rail means, the amount of said fluid to be dispensed along said path so that said area receives said amount of said fluid during passage of said car means along said path past said area.

Re. 33,747

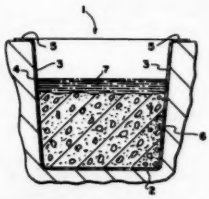
RIGIDIFICATION OF SEMI-SOLID AGGLOMERATIONS

Tyrus W. Hartley, and Dwight N. Hartley, both of Bay City, Mich., assignors to Soli-Tech, Inc., Kawkawlin, Mich.

Original No. 4,668,128, dated May 26, 1987, Ser. No. 627,878, Jul. 5, 1984. Application for reissue May 25, 1989, Ser. No. 357,602

Int. Cl.[5] E02D *3/12*

U.S. Cl. 405—266 **18 Claims**



17. In a method of rigidifying a semi-solid agglomeration of materials composed of solids and liquids confined in a containment, the improvement comprising permitting the agglomeration within said containment to stand for a period of time sufficient to cause heavier solids to settle and excess liquids to accumulate atop such agglomeration; removing at least a substantial portion of said excess liquids; adding to and mixing with the agglomeration remaining in said containment a quantity of meal including a hygroscopic powder and a cementitious binder, and an aggregate to form a substantially homogeneous mass, the quantity of said meal and said aggregate added to said agglomeration being insufficient to overflow said containment; and curing said mass to form a substantially rigid matrix.

Re. 33,748

PROCESS FOR THE PREPARATION OF POLYURETHANE PLASTICS USING DIANHYDRO-HEXITE DIOLS

Holger Meyborg, Odenthal; Kuno Wagner, Leverkusen; James M. Barnes, Wermelskirchen, and Herbert Salzburg, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Original No. 4,383,051, dated May 10, 1983, Ser. No. 357,118, Mar. 11, 1982. Application for reissue May 10, 1985, Ser. No. 733,284

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111093

Int. Cl.[5] C08G *18/00, 18/28;* **C07D** *307/87, 307/93*

U.S. Cl. 521—176 **18 Claims**

1. A process for the preparation of polyurethane plastics comprising reacting

(a) organic polyisocyanates;

(b) compounds containing at least 2 Zerewitinoff-active hydrogen atoms and having molecular weights of from 400 to 10,000; and

(c) chain extenders, characterized in that 1,4-3,6-dianhydrohexites are used as the chain extenders.

10. A polyurethane comprising the reaction product of an organic polyisocyanate, a compound containing at least two Zerewitinoff-active hydrogen atoms and having a molecular weight of from 400 to 10,000 and a 1,4-3,6-dianhydro-hexite.

Re. 33,749

STORAGE STABLE HEAT CURABLE ORGANOSILOXANE COMPOSITIONS CONTAINING MICROENCAPSULATED PLATINUM-CONTAINING CATALYSTS

Chi-Long Lee, Midland; Donnie R. Juen, Sanford; John C. Saam, and Robin L. Willis, Jr., both of Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 4,766,176, dated Aug. 23, 1988, Ser. No. 75,177, Jul. 20, 1987. Application for reissue Aug. 24, 1990, Ser. No. 573,501

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 **16 Claims**

1. In an improved one-part, storage stable, heat curable organosiloxane composition comprising

(A) a curable polyorganosiloxane containing at least two ethylenically unsaturated hydrocarbon radicals per molecule;

(B) an organohydrogensiloxane containing at least two silicon bonded hydrogen atoms per molecule in an amount sufficient to achieve curing of said polyorganosiloxane (A), where the sum of the average number of ethylenically unsaturated hydrocarbon radicals per molecule of (A) and the average number of silicon bonded hydrogen atoms per molecule of said organohydrogensiloxane (B) is greater than 4, and

(C) an amount of a platinum-containing hydrosilation catalyst sufficient to promote curing of said composition at a temperature of at least 70° C. and above,

the improvement comprising the presence of said platinum-containing catalyst in the form of microcapsules that in turn, comprise said catalyst as finely divided particles or droplets that are completely enveloped within a thermoplastic organic polymer where the average diameter of said microcapsules is less than 500 microns, and said thermoplastic organic polymer constitutes at least 50 percent of the weight of said microcapsules.

14. A composition according to claim 1 where said catalyst is distributed throughout the volume of said microcapsules.

PLANT PATENTS

GRANTED NOVEMBER 19, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,714

APPLE ROOTSTOCK — LANCEP VARIETY

Alain Masseron, Castillon La Batille, and Elisa Grillet, Lyons, both of France, assignors to Centre D'Experimentation de Pepinieres, Lyons and Centre Technique Interprofessionnel des Fruits et Legumes, Paris, both of, France

Filed Jun. 15, 1989, Ser. No. 367,230

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct virus-free variety of apple tree useful as an improved rootstock for apple cultivars, substantially as illustrated and described, which when used as such rootstock has better compatibility with all commercial varieties, facilitates more vigorous growth and increases productivity of the grafted variety.

7,715

APPLE ROOTSTOCK - CEPILAND VARIETY

Alain Masseron, Castillon la Batille, and Elisa Grillet, Lyons, both of France, assignors to Centre d'Experimentation de Pepinieres, Lyons and Centre Technique Interprofessionnel des Fruits et Legumes, Paris, both of, France

Filed Jun. 15, 1989, Ser. No. 367,231

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct virus-free variety of apple tree useful as an improved rootstock for apple cultivars, substantially as illustrated and described, which when used as such rootstock has better compatibility with all commercial varieties, facilitates more vigorous growth and increases productivity of the grafted variety.

7,716

POINSETTIA PLANT 'LILO PINK'

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed May 24, 1990, Ser. No. 528,236

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct poinsettia cultivar, substantially as herein shown and described, characterized by its early flowering, self-branching, dark pink flower bracts and dark green foliage.

PATENTS

GRANTED NOV. 19, 1991

ERRATA

For CLASS	See PATENT NO.
460-004	5,065,462
292-035	5,065,486
292-075	5,065,487
292-078	5,065,488
356-432	5,065,775
108-060	5,065,832
198-392	5,065,852
267-140	5,065,869
220-694	5,065,923
222-185	5,065,927
439-264	5,065,941
215-001	5,066,081
359-361	5,066,082
359-213	5,066,083
359-213	5,066,084
385-115	5,066,085
385-041	5,066,086
385-043	5,066,087
385-025	5,066,088
385-035	5,066,089
385-035	5,066,090
385-098	5,066,091
385-033	5,066,092
385-033	5,066,093
385-073	5,066,094
385-099	5,066,095
385-058	5,066,096
385-076	5,066,097
351-221	5,066,116
351-226	5,066,117
356-073	5,066,118
356-124	5,066,119
356-124	5,066,120
356-218	5,066,121
356-241	5,066,122
356-312	5,066,123
356-312	5,066,124
356-316	5,066,125
356-328	5,066,126
356-328	5,066,127
356-349	5,066,128
356-356	5,066,129
356-356	5,066,130

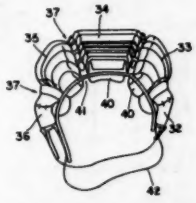
356-401	5,066,131
131-297	5,066,132
359-570	5,066,133
432-160	5,066,229
540-106	5,066,426
424-121	5,066,585
437-007	5,066,599
514-231	5,066,808
430-137	5,066,821
313-309	5,066,833
318-135	5,066,897
318-568	5,066,902
331-057	5,066,929
335-255	5,066,980
395-650	5,067,068
395-375	5,067,069
395-146	5,067,070
395-275	5,067,071
395-650	5,067,072
395-375	5,067,073
395-200	5,067,074
395-425	5,067,075
395-275	5,067,076
395-400	5,067,077
395-400	5,067,078
375-024	5,067,095
395-115	5,067,097
395-126	5,067,098
395-375	5,067,104
395-400	5,067,105
395-575	5,067,106
395-500	5,067,107
359-152	5,067,173

PATENTS

GRANTED NOVEMBER 19, 1991

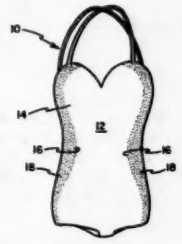
GENERAL AND MECHANICAL

5,065,457
BODY PROTECTOR
Anthony E. Henson, Harbord, Australia, assignor to Albion Hat & Cap Company Pty., Ltd., Chippendale, Australia
Division of Ser. No. 348,813, May 8, 1989. This application Oct. 1, 1990, Ser. No. 591,128
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—2 **11 Claims**



1. A body protector for a sportsman selected from the group consisting of a forearm pad and a shin pad, said protector being integrally formed, being molded from plastics material, and having an inner surface with a plurality of protrusions thereon, each of said protrusions being filled with said plastics material and the spaces between adjacent protrusions providing paths through which air is able to pass between said inner surface and the skin of said sportsman.

5,065,458
APPEARANCE MODIFYING GARMENTS
Mary S. Johnson, Stripers Landing, Rte. 3, Unit 402, Moneta, Va. 24121
Filed Oct. 4, 1990, Ser. No. 592,972
Int. Cl.[5] A41D *5/00*; A41B *11/00*
U.S. Cl. 2—69 **4 Claims**



1. A garment for providing an enhanced appearance to the wearer, the garment comprising:

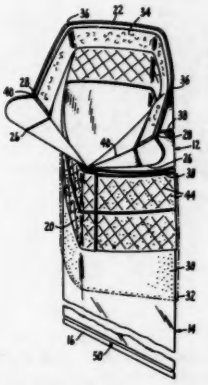
a) an article of form-fitting clothing for conforming to a wearer's body shape;

b) said article having a central shaded area bounded by marginal shaded areas on either side of said central area when said article is viewed from front and back, said central shaded area contrasting with said marginal shaded areas by light and dark shades;

c) said marginal and said central areas when viewed from front and back having distinct lines of demarcation between dark and light shades; and,

d) whereby said distinct line of demarcation between said light and dark shades causes the viewer's eye to be drawn to said central shaded area.

5,065,459
DISPOSABLE PORTABLE URINAL
Surja Tjahaja, 3343 Brittan Ave., #4, San Carlos, Calif. 94070, and Robert L. Nodvik, 2805 Kerckhoff St., San Pedro, Calif. 90731
Filed May 3, 1990, Ser. No. 530,108
Int. Cl.[5] A47K *11/00*
U.S. Cl. 4—144.2 **8 Claims**



1. A disposable portable urinal to accommodate a penis, comprising:

a pliable receptacle having an interior space and provided with a closed end and an opposing open end;

a pliable, collapsible cylindrical collar with the perimeter of one end thereof being sealably attached to the open end of the receptacle, and with the opposing end of the collar having a slot extending axially therefrom to a point intermediate the length of the collar; and

a pair of handle tabs for gripping the collar attached to opposing edges of the slot such that the handle tabs can be used to separate the collar along the slot allowing the penis to be placed within the collar whereupon the handles are used to compress the collar around the penis to prevent leakage.

5,065,460
COMMODE SEAT LIFTING APPARATUS
Debra L. Currin, 715 E. Elm St., Hanford, Calif. 93230
Filed Aug. 30, 1990, Ser. No. 574,884
Int. Cl.[5] A47K *13/10*
U.S. Cl. 4—251 **3 Claims**

1. A commode seat lifting apparatus comprising in combination a commode, the commode including an upper surface with a commode seat pivotally mounted to the upper surface,

and

the commode seat including a side surface,

and

a handle member mounted orthogonally to the side surface,

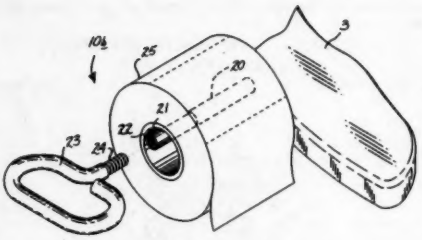
and

wherein the handle member is coaxially aligned,

and

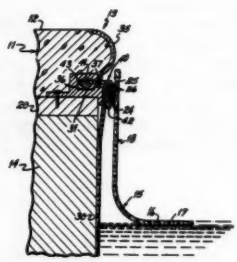
wherein the handle member includes a tubular sleeve, the tubular sleeve defining a cylindrical cavity therewithin defined by a predetermined cross-sectional configuration, and a tube support spindle defined by an external configuration equal to the predetermined cross-sectional configuration frictionally received within the tubular sleeve, and the support spindle including a free end wherein the free

end includes a threaded interior surface, and a "T" shaped handle wherein the "T" shaped handle including a



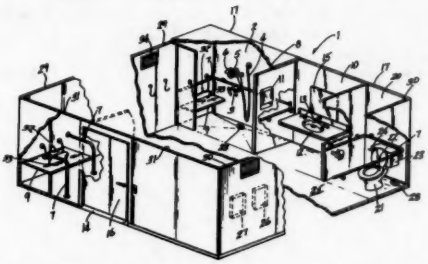
threaded handle shank threadedly receivable within the threaded free end, and a tissue roll captured between the side surface and the "T" shaped handle.

5,065,461
SWIMMING POOL AND COVER
Billy C. Shehan; Billy C. Shehan, Jr., both of 298 E. Mt. Zion Road, Independence, Ky. 41051, and Thomas R. Stubbeman, 309 Main St., Highland Heights, Ky. 41076
Filed Mar. 5, 1990, Ser. No. 488,308
Int. Cl.[5] E04H *4/14*
U.S. Cl. 4—503 **14 Claims**



1. A lined swimming pool and removable cover therefor comprising:
- a first elongated channel disposed along an upper edge of said pool;
- a pool liner having an edge bead disposed in said channel;
- an insertable bead locking means inserted in said channel for locking said bead therein;
- a first portion of a two component releasable locking means secured to said bead locking means outside said first channel and exposed to the interior of said pool;
- a pool cover having dimensions sufficient for extension thereof from wall to wall across the pool;
- said pool cover having peripheral edges, and
- a second portion of said two component releasable locking means secured to said peripheral edge of said cover and releasably engageable with said first portion outside said first channel for releasably securing said cover to said bead locking means outside said first channel and across said pool.

5,065,462
HANDICAP-ACCESSIBLE RESTROOM
Raymond Romano, 314 Park St., West Haven, Conn. 06516
Filed Nov. 2, 1990, Ser. No. 608,537
Int. Cl.[5] A47K *4/00, 11/00*
U.S. Cl. 4—604 **18 Claims**



1. A mobile handicap accessible restroom facility comprising:
- a floor and vertical walls extending from the floor;
- a sink portion in said facility sized for use by wheelchair bound persons;
- a commode portion in said facility sized for use by wheelchair bound persons;
- an entrance door to said facility sized to allow passage of a wheelchair therethrough;
- at least one drain hole spaced along said floor;
- a shower portion in said facility sized to permit wheelchair access, having a shower wall and a shower head detachably secured thereto;
- wherein said sink portion, commode portion and shower portion are affixed to the vertical walls;
- a pressurized supply of water to said restroom;
- a hose attached to said shower head and to said pressurized water supply;
- said hose having a length sufficient to allow said shower head to reach all areas within said restroom for cleaning purposes;
- said floor being tapered downward in a direction toward said at least one drain hole; and
- means for facilitating movement comprising mounting said restroom on a plurality of wheels and including a hitch associated therewith.

5,065,463
STRUCTURE OF SHOWER WITH SWIVEL BRUSH AND MULTI-STEP DRAIN CONTROL
Mike Le, 7/F., No. 20 Lane 50, Yan Chi St., Taipei, Taiwan
Filed Mar. 28, 1990, Ser. No. 500,567
Int. Cl.[5] A46B *13/06*
U.S. Cl. 4—606 **5 Claims**

1. A shower, comprising:
- a shower head having a water outlet and defining within said shower head first, second, third, fourth, fifth and sixth water channels;
- a drain cock having first and second passageways and being

set in said shower head and connected to said six water channels to control the flow of water in said water channels;

a rotating brush attached to said water outlet;

a water wheel attached to said rotating brush to drive said rotating brush and cause said brush to rotate;

an adapter for connecting said shower head to a water outlet of a source of water;

a double-core water pipe connecting said adapter to said shower head and defining water supply and return channels therein;

characterized in that when said drain cock is at a first drain position, water is permitted to flow from said first water channel through said first passageway of said drain cock into said fifth water channel to drive said water wheel and to cause said brush to rotate and thence through said sixth water channel and said second passageway to discharge through said adapter;

when said drain cock is at a second drain position, water is permitted to flow from said first water channel through said first passageway of said drain cock into said fifth water channel to drive said water wheel and to cause said brush to rotate and thence through said sixth water channel and said second passageway of said valve cock into said third water channel to discharge from said water outlet of said shower head;

when said drain cock is at a third drain position, water is permitted to flow from said second water channel through said second passageway of said drain cock into said third water channel to discharge from said water outlet of said shower head;

and when said drain cock is at a fourth drain position, water is permitted to flow from said second water channel through said second passageway of said drain cock into said fourth water channel for discharge through said adapter.

5,065,464

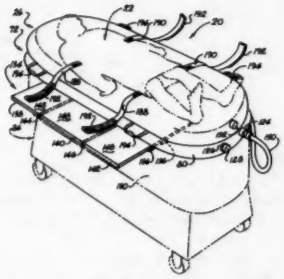
APPARATUS FOR TRANSFERRING A PATIENT BETWEEN PATIENT SUPPORT SURFACES

Frederick W. Blanchard, North Charleston, and Thomas J. Moore, Charleston, both of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Filed Jul. 30, 1990, Ser. No. 560,045

Int. Cl.[5] A61G *7/10*; B65G *7/06*

U.S. Cl. 5—81 R **28 Claims**



1. Apparatus for transferring a patient relative to a supporting surface, the apparatus comprising:

(a) a bladder of a sufficient size to support a supine or prone patient,

(i) said bladder defining an enclosure impervious to air,

(ii) a peripheral web member subdividing said enclosure into two separate chambers,

(iii) the perimeter of one of said chambers surrounding at least about three quarters of the perimeter of said other of said chambers,

(iv) said peripheral bladder web member further defining a plurality of holes through which air can pass between said two chambers,

(v) said bladder further defining an opening into said surrounding bladder chamber, and

(vi) whereby upon inflation of said bladder through said bladder opening, the inflating fluid enters and pressurizes said surrounding bladder chamber prior to pressurizing the surrounded chamber, thereby forming an inflated boundary around the patient to guard against inadvertently rolling the patient off the transfer apparatus;

(b) a bladder valve,

(i) said bladder valve covering said bladder opening, and

(ii) said bladder valve selectively controlling access between said bladder surrounding chamber and the environment of the apparatus; and

(c) means for defining an air bearing, said air bearing means being secured to one side of said bladder and outside said bladder enclosure, said air bearing means being adapted to reduce the friction between the patient transfer apparatus and its supporting surface to thereby facilitate the sliding of the patient transfer apparatus relative to its supporting surface.

5,065,465

WATER MATTRESS FOR A THERAPY WATER BED

Jan Nystad, Elverhøy, N-2312, Ottestad, Norway

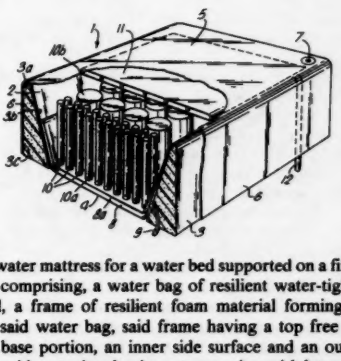
PCT No. PCT/NO89/00057, § 371 Date Dec. 6, 1990, § 102(e) Date Dec. 6, 1990, PCT Pub. No. WO89/12414, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 13, 1989, Ser. No. 613,894

Claims priority, application Norway, Jun. 13, 1988, 882591

Int. Cl.[5] A47C *27/10*

U.S. Cl. 5—450 **9 Claims**



1. A water mattress for a water bed supported on a firm rigid surface comprising, a water bag of resilient water-tight sheet material, a frame of resilient foam material forming a wall around said water bag, said frame having a top free edge, a bottom base portion, an inner side surface and an outer side surface, said water bag having a top portion with lateral extensions depending alongside the outer side surface of said frame, said top portion being stretched across the top free edge of said frame and secured to said frame, said water bag further including a bottom portion extending along the inner side surface of said frame from the bottom base portion of the frame to the top edge of the frame, said top and bottom portions of said water bag being joined along the top free edge of said frame, a valve for dispensing water into said water bag and discharging water from said water bag, and wherein the bottom portion of said water bag includes two layers of said resilient water-tight sheet material with a space therebetween to define an intermediate air chamber, an air hose communicable with said air chamber to supply air to said air chamber and a plurality of hollow inflatable cylindrical air pocket members communicable with said air chamber and extending upwardly from the bottom portion of said water bag toward the top portion of said water bag and being free from connection with the top portion of said water bag.

5,065,466

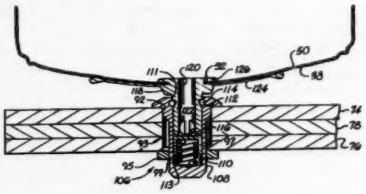
QUICK DISCONNECT COUPLING FOR A LOW AIR LOSS PATIENT SUPPORT

James M. C. Thomas, Mt. Pleasant; James R. Stolpmann, Charleston; William T. Sutton, Charleston, and James J. Romano, Charleston, all of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Division of Ser. No. 355,755, May 22, 1989, Pat. No. 4,949,414, which is a continuation-in-part of Ser. No. 321,255, Mar. 9, 1989, abandoned. This application Jul. 19, 1990, Ser. No. 555,164

Int. Cl.[5] A61G *7/057*

U.S. Cl. 5—453 **4 Claims**



1. A hand-detachable airtight connection for an air sack of a low air loss patient support, the patient support having an air sack supply opening defined therein and through which air is to be supplied to the air sack, the air sack having an air entrance opening defined through a wall thereof, the apparatus comprising:

(a) an elongated connection fitting having:

(i) an exterior configured to engage air-tightly with said air sack supply opening,

(ii) an interior configured with an axially disposed coupling cylinder to receive a coupling in air tight engagement therewith, said coupling cylinder having a coupling entrance at one end of said cylinder,

(iii) a first groove defined completely around said fitting interior,

(iv) a resiliently deformable flexible O-ring held in said first groove, and

(v) a channel opening defined radially through said fitting to receive air therethrough; and

(b) an elongated coupling secured at one end to said air entrance opening of said sack and extending outwardly therefrom and having

(i) an axial opening defined through said coupling, and

(ii) a second groove defined around said coupling to receive said deformable O-ring therein when said coupling is inserted into said fitting in airtight engagement with said fitting;

(c) an attachment grommet configured with an opening to receive said coupling therethrough and disposed within said interior of said sack and extending radially outwardly around said air entrance opening of said sack; and

(d) a pull tab disposed against the exterior of said sack and extending radially outwardly from said air entrance opening of said sack.

5,065,467

PREFABRICATED LATTICE PANELS FOR A BRIDGE

Richard C. E. Forsyth, Hook, England, assignor to Mabey & Johnson Limited, Reading, United Kingdom

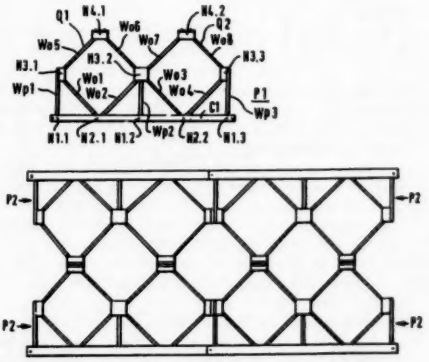
Filed May 8, 1990, Ser. No. 520,574

Claims priority, application United Kingdom, May 25, 1989, 8911984

Int. Cl.[5] E01D *9/02*

U.S. Cl. 14—13 **13 Claims**

8. A prefabricated lattice panel for a main girder truss in a lattice panel bridge, to extend upright along one side of the bridge, comprising a formation of web members welded to a single chord member to form a lattice having at least one quadrilateral, the or each said quadrilateral being welded at a single corner of the or each said quadrilateral to the single chord member, an opposite corner of the or each said quadrilateral having a shear force-transmitting connection fitment for



connection of the panel in the bridge, an intermediate corner of the quadrilateral, or of one said quadrilateral, being positioned at one end of the panel and having a fitment for making a shear force-transmitting connection of the panel in the bridge.

5,065,468

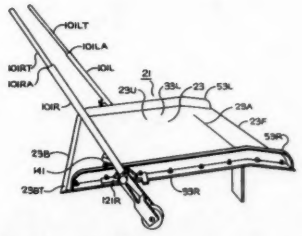
PORTABLE DOCK PLATE

Danny G. Sherrod, Burleson, Tex., assignor to Bluff Manufacturing, Inc., Burleson, Tex.

Filed Feb. 26, 1990, Ser. No. 485,219

Int. Cl.[5] F01D *1/00*

U.S. Cl. 14—72.5 **16 Claims**



1. A dock plate, comprising:

a generally rectangular shaped plate means having upper and lower surfaces, first and second opposite ends of a given width and two opposite sides of a given length,

two side members,

means for removably attaching two side members to said two sides respectively whereby said two side members may be removed from said dock plate or attached to said two sides of said dock plate at different positions along their lengths, respectively,

each side member comprising:

a support member attached to said side member,

an axle attached to said support member such that said axle extends outward from the side of said plate means when said side member is attached to its side of said plate means,

a handle having first and second ends with a wheel coupled to said first end thereof,

said handle being pivotally coupled to said axle such that

said handle may be pivoted to an operative position and to an inoperative position when said side member is attached to its side of said plate means,

in said operative positions of said handles, said wheels are located below said lower surface of said plate means with said second ends of said handles extending upward and being located closer to said first end of said plate means than to said second end thereof whereby downward force may be applied to said second ends of said handles with their wheels located on the floor or the like to lift said plate means above the floor or the like to allow it to be moved on said wheels,

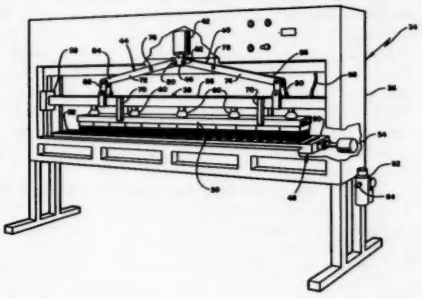
in the inoperative position of said handles, said second ends of said handles are located closer to said second end of said plate means than to said first end of said plate means whereby said handles are out of the way and said wheels cannot be used to lift and move said plate means.

5,065,469

APPARATUS FOR REMOVING DEBRIS FROM A CUTTING BED

Paul E. Takken, Hudsonville; Robert G. Scheckel, Nunica, both of Mich., and Steven D. Peo, Michigan City, Ind., assignors to BPS Systems, Inc., Hudsonville, Mich.

Filed Oct. 12, 1989, Ser. No. 420,171
Int. Cl.[5] B08B *11/02, 7/02*
U.S. Cl. 15—89 **29 Claims**



1. An apparatus for removing debris from a substrate comprising:

a head;

support means for supporting said substrate by said head;

mover means for accelerating said head in a given direction, said mover means including means for producing linear movement and linkage means connecting said mover means with said head in a manner that said head is moved a greater amount than said mover means for amplifying said linear movement when applied to said head; and

means for decelerating said head after said mover means has accelerated said head;

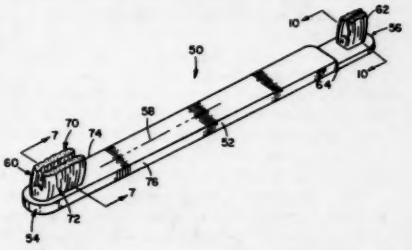
wherein said linkage means includes an elongated member having first and second opposite ends, said linear movement being applied to one of said opposite ends, the other one of said opposite ends being connected to said head, said linkage means further including means for pivotally mounting said elongated member at a pivot point between said first and second opposite ends, wherein the distance between said pivot point and said one of said opposite ends being less than the distance between said pivot point and said other one of said opposite ends.

5,065,470

TOOTHBRUSH

Albert J. Diamond, 229 E. 28th St., New York, N.Y. 10016

Filed May 23, 1990, Ser. No. 527,342
Int. Cl.[5] A46B *9/04*
U.S. Cl. 15—106 **9 Claims**



1. A toothbrush comprising:

A) a handle having a first end and a second end, a longitudinal centerline extending between said first and second ends, side edges extending between said first and second ends, and a width dimension extending between said side edges;

B) a posterior teeth cleaning head on said handle first end, said posterior teeth cleaning head including

(1) two rows of outside bristles, one row being on one side of said handle longitudinal centerline and extending therealong from said handle first end towards said handle second end and a second row being located on another side of said handle longitudinal centerline, said outside bristles having one end fixed to said handle and having a curved body which is curved to be concave with respect to said handle longitudinal centerline, and a second end spaced from said handle, said outside bristles having a height measured between said bristle first and second ends, and

(2) central bristles mounted on said handle between said two rows of outside bristles and extending along said handle longitudinal centerline from said handle first end towards said handle second end, said central bristles including

(a) a row of centermost bristles each being mounted at a first end thereof on said handle along said handle longitudinal centerline and having a second end spaced from said handle and a height as measured between said centermost bristle first and second ends which is less than the height of said outermost bristles, and

(b) a plurality of rows of intermediate bristles, a plurality of first rows of intermediate bristles being located on each side of and immediately adjacent to said row of centermost bristles between said centermost bristles and said outermost bristles, and a plurality of further rows of intermediate bristles located on each side of said first rows of intermediate bristles between said first rows of intermediate bristles and said outermost bristles, each intermediate bristle having a first end mounted on said handle and a second end spaced from said intermediate bristle first end and a height as measured between said intermediate bristle first and second ends which is less than said centermost bristle height, said intermediate bristles in each row of intermediate bristles being a mirror image of the corresponding intermediate bristles in the other row, said bristles in said first row of intermediate bristles having a first row height and the bristles in a row of intermediate bristles located immediately adjacent to said outermost bristles having a second height, said first row height and said second height being identical to each other and exceeding the height of all remaining bristles in said further rows of intermediate

bristles, the height of the intermediate bristles in each row gradually decreasing from said first and second heights adjacent to the centermost bristles and adjacent to said outermost bristles to a shortest value midway between the centermost bristles and the outermost bristles and forming a concave shape on each side of the centermost bristles with the concave shapes on each side of the centermost bristles being identical; and

C) an anterior teeth cleaning head on said handle second end, said anterior teeth cleaning head including

(1) two rows of outside bristles, one row being on one side of said handle longitudinal centerline and extending therealong from said handle second end towards said handle first end and a second row being located on another side of said handle longitudinal centerline, said anterior head outside bristles having one end fixed to said handle and having a curved body which is curved to be concave with respect to said handle longitudinal centerline, and a second end spaced from said handle, said anterior head outside bristles having a height measured between said anterior head outside bristle first and second ends, and

(2) central bristles mounted on said handle between said anterior head two rows of outside bristles and extending along said handle longitudinal centerline from said handle second end towards said handle first end, said anterior head central bristles including

(a) a row of centermost bristles each being mounted at a first end thereof on said handle along said handle longitudinal centerline and having a second end spaced from said handle and a height as measured between said anterior head centermost bristle first and second ends which is less than the height of said anterior head outermost bristles, and

(b) two rows of intermediate bristles, one row of intermediate bristles being located on each side of said anterior head row of centermost bristles between said anterior head centermost bristles and said anterior teeth cleaning head outermost bristles, each anterior head intermediate bristle having a first end mounted on said handle and a second end spaced from said anterior head intermediate bristle first end and a height as measured between said intermediate bristle first and second ends which is less than said anterior head centermost bristle height, said anterior head intermediate bristles in each row of anterior head intermediate bristles being a mirror image of the corresponding anterior head intermediate bristles in the other row.

5,065,471

ANTIFREEZE SELF-SPRAYING AND -WARMING WINDSHIELD WIPER

Sylvain Laplante, 180, 37E Avenue, App. 2, P.O. Box 476, Quebec Saint-Zotique, Canada J0P 1Z0

Filed Nov. 9, 1990, Ser. No. 610,961

Int. Cl.[5] B60S *1/46, 1/38*

U.S. Cl. 15—250.04 **3 Claims**

1. A wiping member for sweepingly cleaningly engaging a windshield pane of an automobile and for use with power means which laterally displace said wiping member over said windshield in a cyclic back and forth movement, said wiping member including:

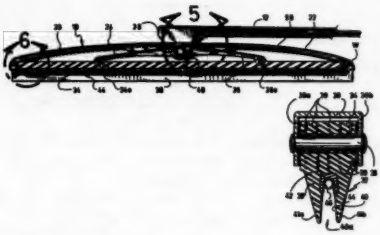
(a) an elongated bead, to cooperate with said power means;

(b) an elongated blade, integrally dependent from said bead and defining two transversely spaced lips forming a lengthwise first channel therebetween, said first channel being generally U-shape in cross-section and defining a first flooring, merging with said bead and interconnecting said lips, the free end tips of said blade lips defining therebetween a first mouth opposite said first flooring, said lips being resilient for bendingly yieldingly engaging said windshield transversely at their tips;

(c) an elongated, thermally conductive casing, being of generally U-shape in cross-section and enclosed within said first channel and directly contacting in operative position said lips and said first flooring, said casing defining two side legs and a second flooring interconnecting said side legs thereof, a second elongated channel defined between said casing side legs, a second mouth defined by said second channel between the tips of said casing side legs opposite said second flooring, said second mouth extending short of said first mouth whereby said second channel opens into said first channel through said second mouth;

(d) heat generation means attached to said casing for heating said casing;

(e) first securing means, to fixedly secure said casing within said first channel in its said operative position;



(f) a fluid pipe, enclosed within said second channel and directly contacting in operative position said second flooring and side legs; said pipe to be force fed with a heat-vector fluid, said pipe including a number of radial through-bores for through passage of said force-fed fluid from said pipe transversely radially outwardly therefrom; said radial through-bores being in register with said second mouth to open therethrough, into said first channel, for fluid escape therefrom through said blademouth toward said windshield; and

(g) second securing means, to fixedly secure said fluid pipe within said second channel in its said operative position; wherein said casing and said fluid pipe extend for substantially all the length of said wiping blade; said bead, blade and pipe are each made from a heat-conducting material; wherein upon energizing of said heat-generating means said casing and subsequently, said fluid pipe, blade and bead are concurrently warmed, for wiping member use in sub-freezing climates.

5,065,472

SPRING LOADED BRAKE ASSEMBLY FOR INDEXING SOOTBLOWER

Steven P. Carpenter; James C. Cavinee, and James J. Krannitz, all of Lancaster, Ohio, assignors to The Babcock & Wilcox Co., New Orleans, La.

Filed Jan. 24, 1991, Ser. No. 645,220

Int. Cl.[5] F23J *3/02*

U.S. Cl. 15—317 **12 Claims**

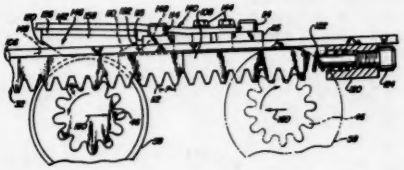
1. A brake assembly for impeding longitudinal movement of a sootblower carriage being propelled along a line of travel by a driving force generated by a motor, said brake assembly comprising:

a frame fixed relative to said sootblower carriage;

an engagement block having an engagement surface; and

deflectable biasing means secured to said frame for biasing said engagement block into said line of travel of said sootblower carriage, said engagement block being mounted to said biasing means so as to orient said engage-

ment surface for contact with said sootblower carriage, said biasing means coacting with said engagement block and said engagement surface so as to impede longitudinal movement of said sootblower carriage thereby increasing said driving force generated by said motor to an amount



wherein said sootblower carriage causes deflection of said engagement block in a direction counter to said biasing means and out of said line of travel thereby allowing said sootblower carriage to continue longitudinal movement along said line of travel.

5,065,473

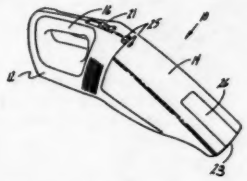
FILTER ASSEMBLY FOR A VACUUM CLEANER

Charles Z. Krasznai, Trumbull, and Richard B. Kosten, West Haven, both of Conn., assignors to Black & Decker Inc., Newark, Del.

Division of Ser. No. 294,619, Jan. 9, 1989, Pat. No. 4,967,443. This application Jun. 14, 1990, Ser. No. 601,550

Int. Cl.[5] A47L *5/24*

U.S. Cl. 15—339 **7 Claims**



1. A vacuum cleaner comprising:

a motor;

a housing enclosing said motor;

a fan driven by said motor for producing a vacuum;

a canister formed from a material that is given physical characteristics that render the canister generally opaque, said canister being removably attached to a front end of said housing for reception of foreign matter, and air driven into said canister in response to the vacuum developed by said fan; and

means for visually determining the amount of foreign matter within said canister, said means comprising a window on an upper surface of said canister, said window being formed integrally of said material with said canister, said material of said window being given physical characteristics that render said window generally transparent.

5,065,474

MULTIPLE POSITION ADAPTER FOR MOUNTING WIPER-BLADE ASSEMBLY ON WIPER ARM

Cedric S. K. Charng, Taipei, Taiwan, assignor to China Wiper Special Rubber Co., Ltd., Taiwan

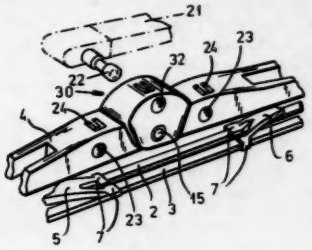
Filed Jun. 22, 1990, Ser. No. 543,134

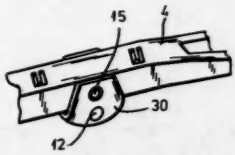
Int. Cl.[5] B60S *1/40*

U.S. Cl. 15—250.32 **4 Claims**

1. An adapter for mounting a blade assembly on an elongated wiper arm, the blade assembly having a transversely throughgoing blade hole and generally planar and parallel flat top and bottom surfaces symmetrically flanking an axis of the blade hole, the arm having a transversely projecting arm pivot pin, the adpater comprising:

a U-section adapter body embracing the blade assembly at the blade hole and formed with a transverse adapter-body hole through which the pin is engageable and with a pair of side walls that flank the blade assembly at the blade hole, the body being shaped to fit in one position against





the top surface and in another position against the bottom surface of the blade assembly, the side walls engaging over the blade hole in both positions;

latch means for releasably retaining the pin in the adapter-body hole in both positions; and

mounting means for securing the side walls of the adaptor body to the blade assembly in both positions of the adaptor body on the assembly.

5,065,475

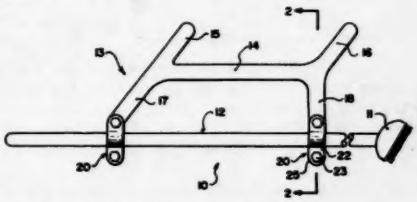
HANDLE ATTACHMENT FOR AN IMPLEMENT HAVING AN ELONGATE HANDLE SHAFT

Allan Watt, 11 Morton Bay, Winnipeg, Manitoba, Canada R3R 2C5

Filed Aug. 9, 1990, Ser. No. 564,574

Int. Cl.[5] A01B *1/22*; B25G *3/00*

U.S. Cl. 16—114 R **3 Claims**



1. A hand operated implement comprising an elongate handle shaft, an implement head on the remote end of the handle shaft and a hand grasping section mounted on the shaft so as to project outwardly to one side of the shaft, the hand grasping section comprising a first hand grip portion defined by an elongate bar substantially parallel to the handle shaft and extending along part of the length of the shaft, coupling means mounting the first hand grip portion on the handle shaft, a second hand grip portion mounted on the first hand grip portion adjacent one end thereof and extending outwardly therefrom in a direction extending away from the handle shaft and inclined relative to the first hand grip portion at an acute angle relative to a line extending along the first hand grip portion

toward the implement head, and a third hand grip portion mounted on the first hand grip portion adjacent an opposed end thereof and extending outwardly therefrom in a direction away from the handle shaft and substantially parallel to the second hand grip portion, the hand grasping section lying substantially in an axial plane of the handle shaft arranged to stand upwardly from the handle shaft when the implement head is in operating position on the ground, each of said second and third hand grip portions consisting solely of a substantially cylindrical body having one end connected to said first hand grip portion and an opposed end at which said each hand grip portion terminates such that said each hand grip portion can receive a hand of the user only gripped around the body.

5,065,476

HANDLE ARRANGEMENT FOR A HANDHELD PORTABLE TOOL

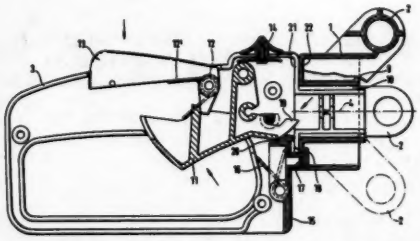
Hans-Peter Dohse, Rommelshausen, and Jochen Kramer, Stuttgart, both of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 23, 1990, Ser. No. 571,291

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929881; Jul. 4, 1990, 4021277

Int. Cl.[5] B27B *17/02*

U.S. Cl. 16—114 R **16 Claims**



1. A rearward handle arrangement for a handheld portable tool having a motor housing holding a motor and a forward handle fixedly attached to the housing so as to permit two-handed operation of the tool by an operator, the tool defining a horizontal axis and the rearward handle arrangement comprising:

a carrier part for attaching the rearward handle arrangement to the housing of the tool;

a rearward handle;

journalling means for rotatably journalling said rearward handle in said carrier part so as to permit said rearward handle to rotate about said axis relative to said carrier part and said forward handle;

said carrier part and said rearward handle conjointly defining an interface; and,

unlatchable detent means disposed at said interface for self-latching said rearward handle to said carrier part at any one of a plurality of predetermined angular positions about said axis and corresponding to respective work positions in which the tool can be held by the operator.

5,065,477

CALENDAR ROLLERS WITH ROUNDED TEETH FOR CRIMPING SLIVER AND INCREASING COHENSION LENGTH

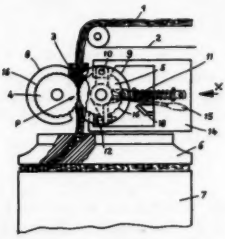
Hansulrich Eichengerger, and Heinz Clement, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sep. 20, 1989, Ser. No. 410,312

Claims priority, application Switzerland, Sep. 23, 1988, 03540/88

Int. Cl.[5] D01G *27/00*

U.S. Cl. 19—150 **13 Claims**



1. A device for increasing the cohesion length of sliver, said device comprising

a pair of parallel calendar rollers disposed in spaced relation to a gap therebetween, each said roller having a plurality of transversely disposed protuberances thereon for inter-engaging in spaced relation with said protuberances of the other of said rollers to slightly crimp a sliver passing through said gap to increase the cohesion of length of the sliver; and

means for spring biasing at least one of said rollers towards the other of said rollers, each said protuberance being of tooth-like cross-section with rounded edges and a pair of flanks, each flank defining an angle with a radius of said respective roller passing through a center of said protuberance of greater than 45°.

5,065,478

PROCESS AND DEVICE FOR THE RECEPTION OF MINERAL FIBERS

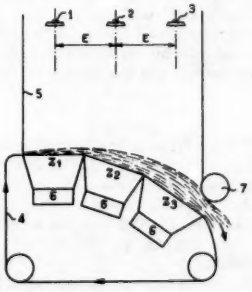
Hans Furtak, Speyer am Rhein, Fed. Rep. of Germany; Wilfrid Naber, Rantigny, and Raymond Lejeune, Rouen both of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Jun. 29, 1990, Ser. No. 545,606

Claims priority, application European Pat. Off., Jun. 29, 1989, 89401864.7

Int. Cl.[5] D01G *25/00;* **B27N** *3/04;* **B29C** *43/22*

U.S. Cl. 19—296 **13 Claims**



1. Process for receiving and separating fibers and gases produced by multiple fibering machines to obtain a mat of mineral wool, said process comprising the steps of:

collecting the fibers by suction of the gases, wherein each fibering machine comprises its own collecting zone; and

evacuating the collected fibers from the collecting zone through at least one conveyor belt common to several collecting zones, wherein said collecting zones comprise surfaces which increase in a direction of an increase in base weight on said conveyor belts;

wherein said evacuating step comprises the step of:

evacuating the fibers by two component conveyor belts, wherein the surfaces of the collecting zones increase in a direction of a final forming place of a common belt;

wherein each of said collecting zones comprise portions of said conveyor belts, a partial vacuum exerted on the fibers is the same for all of said collecting zones, the path of the conveyor belts is convex, and the increase of the surfaces of the collecting zones is obtained by a modification of an angle of inclination vertical to the collecting surface relative to an axis of rotation of the fibering machine joined to the collecting surface.

5,065,479

VENTURI-TYPE CONVEYOR FOR FIBER LAYING IN NONWOVEN MATERIAL PRODUCTION

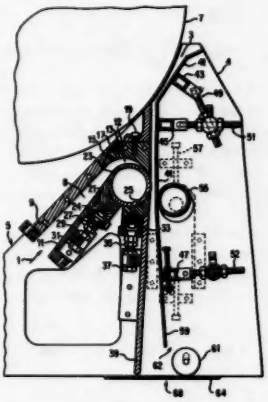
Claudio Governale, Via Venezia, 44, 35100 - Padova, Italy

Filed Apr. 6, 1990, Ser. No. 505,128

Claims priority, application Italy, Apr. 6, 1989, 41564 A/89

Int. Cl.[5] D01G *15/46*

U.S. Cl. 19—303 **10 Claims**



1. A device for producing fibrous non-woven structures, comprising:

a first Venturi-type duct conveying an air flow over the lateral surface of a carding cylinder to remove fibers from the lateral surface of said carding cylinder and to convey the fibers to a mobile forming surface for said non-woven structures;

a second duct connected to the first duct at a position downstream of the point where fiber is removed from the lateral surface of the carding cylinder, wherein a flow of compressed air is fed through said second duct to create in the first duct the air flow removing the fibers; and

an adjusting member to adjust the outlet section of said second duct where the second duct is connected to the first duct.

5,065,480

FASTENING AND ADJUSTING DEVICE, PARTICULARLY FOR SKI BOOTS

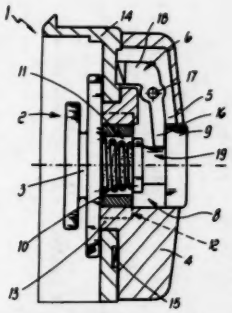
Giuseppe De Bortoli, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed May 7, 1990, Ser. No. 519,576

Claims priority, application Italy, May 15, 1989, 82541 A/89

Int. Cl.[5] A43C *11/00*

U.S. Cl. 24—68 SK **4 Claims**



1. Fastening and adjusting device, particularly for ski boots, comprising at least one winder for at least one traction element and a skier accessible knob, said knob being connected to said at least one winder, said knob having a first seat for a temporary locking element for locking to a body which is rigidly connectable to said boot, said knob and winder having a second seat and a third seat respectively for a releasing means of said knob from said body and for a resilient member, said releasing means comprising a pushbutton at one end partially protruding outside said knob and at another end interacting with said resilient member located at said third seat formed in said winder and communicating with said second seat formed in said knob, said winder being constituted by a spool having one or more annular races for said at least one traction element, said at least one traction element comprising a cable, said knob being substantially circular, said temporary locking element being a pawl which is arranged in said first seat of said knob, said first seat being substantially L-shaped, wherein said pawl is substantially L-shaped and has a bigger first wing hinged by means of a pivot inside said first seat at a junction with a smaller second wing, and wherein said first wing has an end located at a groove formed on said pushbutton, said body being provided with an annular toothing which faces said knob, said second wing being forced to interact with the annular toothing of said body by means of said resilient member.

5,065,481

CLAMPING DEVICE FOR A SKI BOOT

Klaus Walkhoff, Kreuzlingen, Switzerland, assignor to Raichle Sportschuh AG, Kreuzlingen, Switzerland

Filed Sep. 24, 1990, Ser. No. 588,442

Claims priority, application Switzerland, Sep. 26, 1989, 03483/89

Int. Cl.[5] A43C *11/00*

U.S. Cl. 24—68 SK **10 Claims**

1. A clamping device for a ski boot comprising:

a clamping element;

a rotatably mounted winding-up element for the winding-up and unwinding of said clamping element;

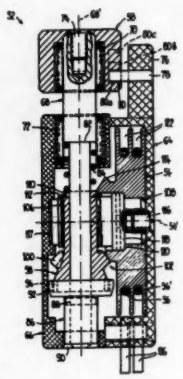
an actuating element pivotable to and fro within a working pivot range for the intermittent driving of the winding-up element in the winding-up direction;

a take-up connection rotatable in the winding-up direction for connecting said actuating element to a transmission member;

a return catch device for preventing said transmission member from rotating oppositely to the winding-up direction;

a coupling for connecting the transmission member to the winding-up element and controllable as a result of the displacement of the transmission member;

said transmission member being displaceable as a result of a pivoting of the actuating member for the purpose of releasing the coupling;



a slotted control;

said actuating element during the pivoting out of the working pivot range oppositely to the winding-up direction, is movable by said slotted control in the direction of its pivot axis; and

said transmission member being displaceable as a result of this movement oppositely to the winding-up direction for the release of the coupling.

5,065,482

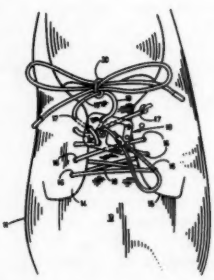
SECURING APPARATUS

Stephen J. Lofy, 2928 21st St., Bakersfield, Calif. 93301

Filed Aug. 20, 1990, Ser. No. 569,623

Int. Cl.[5] A43C *7/00*

U.S. Cl. 24—712.1 **8 Claims**



1. A securing apparatus for drawing a pair of work objects toward each other in interoperation with a first line borne by at least one of said work objects, the apparatus comprising a second line having means for attachment to the other of said work objects; and a substantially ridged plate having a first set of holes through which the first line can be extended while attached at other portions to said first and second work objects and a second set of holes extending through the plate through which the second line is extended in sliding movement therethrough to permit said work objects to be drawn toward each other and in such a manner as to dispose a section of the second line beneath said plate in overlaying relation to another portion of the second line to impart sufficient resistance substantially to prevent movement of the second line relative to the plate thus retaining the work objects substantially in the positions relative to each other they are at the time said drawing of the second line is terminated.

5,065,483

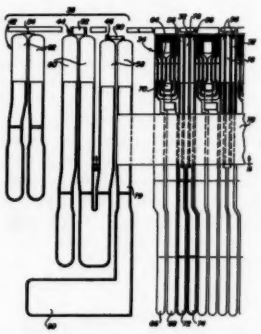
METHOD OF LAPPING MAGNETIC RECORDING HEADS

Robert P. Zammit, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1991, Ser. No. 656,666

Int. Cl.[5] G11B *5/42*

U.S. Cl. 29—603 **10 Claims**



1. A method of making a thin film magnetic head comprising the steps of:

forming at least one thin film magnetic head element on a substrate, the head including at least one magneto-resistive read element;

forming finish lapping guides on the substrate, one at each side of said at least one thin film magnetic head element;

forming resistive lapping guides on the substrate, one adjacent to each of said finish lapping guides;

lapping said substrate and said at least one magneto-resistive read element and said finish lapping guides;

stopping the lapping when the electrical resistance of the finish lapping guides, Rf, equals the formula;

$$Rf = \frac{Hr}{Hf}(Rr - R1) + R1$$

where

Hr is the height dimension of the resistive lapping guide as initially formed,

Rr is the electrical resistance of the resistive lapping guide as initially formed,

Hf is the final height dimension of the finished lapping guide as required, and,

$$R1 = \frac{Hr\,Rr - Hi\,Ri}{Hr - Hi}$$

where

Hi is the height dimension of the finish lapping guide as formed, and

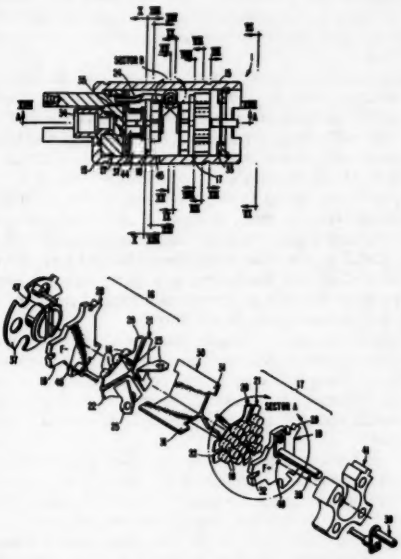
Ri is the electrical resistance of finish lapping guide as formed.

5,065,484

ROTATING RECTIFIER ASSEMBLY

Gordon A. Pinchott, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 338,037, Apr. 14, 1989, Pat. No. 4,959,707.
This application Feb. 7, 1990, Ser. No. 476,344
Int. Cl.[5] H01L *21/58*
U.S. Cl. 29—25.02 3 Claims



3. In a method of assembling a rotating rectifier assembly comprising axially loading components of the rectifier assembly which are arranged within a tubular housing of the housing of the assembly, the improvement comprising supporting diode semiconductor devices of the rotating rectifier assembly within the housing and in relation to other components of the rectifier assembly so that the diode semiconductor devices are not compressed by said axial loading of the other components whereby compressive stresses on the diode semiconductor devices due to the axial loading of the component are avoided, further comprising the step of flowing a liquid coolant through said rectifier assembly for cooling said diode semiconductor devices, and wherein gas which is centrifugally separated from the liquid during rotation of the rectifier assembly is permitted to escape from the rectifier assembly through passage means located along the axis of rotation of the rectifier assembly.

5,065,485

ENCLOSED INNERSPRING MATTRESS COVER AND PROCESS FOR ASSEMBLING SAME

George Zocco, 1345 Burlington Rd., Virginia Beach, Va. 23464

Filed Feb. 15, 1990, Ser. No. 480,315
Int. Cl.[5] B68G *7/00*
U.S. Cl. 29—91.1 7 Claims

1. A process for manufacturing a mattress device having an innerspring member having a top and bottom surface, an endless compressible frame member having a top surface and a bottom surface and an inside and an outside, a bottom panel member having a top surface and a bottom surface, and a top panel member having a top surface and a bottom surface, first and second fastening means, first and second border fabrics, and first and second cover fabrics, comprising the steps of:

attaching the first fastening means to a first edge of the first border fabric then attaching a second edge of said first border fabric to the first cover fabric;

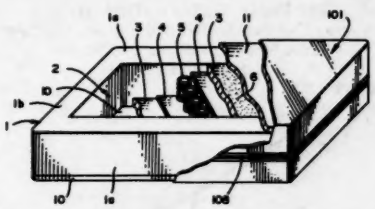
attaching the second fastening means to a first edge of the second border fabric then attaching a second edge of said second border fabric to the second cover fabric;

permanently securing the top said bottom panel member to the bottom of said compressible frame member, wherein said compressible frame member comprises a compressible foam material;

positioning the bottom panel member and frame member inside said first border fabric and on top of said first cover fabric;

then positioning said innerspring member inside of said compressible frame member and on top of said compressible frame member;

then securing said first and second fastening means enclosing



said top panel member, said bottom panel member, and said compressible frame with a covering means;

wherein the top of said innerspring member and the top of said bottom panel member are each upwardly directed during said step of positioning said innerspring member inside of said compressible frame member and on top of said panel member;

wherein in the top of said bottom panel member and the top of said compressible frame member are each upwardly directed during said step of securing the top of said bottom panel member to the bottom of said compressible frame member;

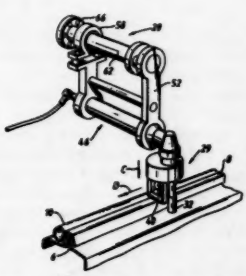
wherein the tops of said bottom panel member, said top panel member, said compressible frame member and said innerspring member are all upwardly directed during said step of securing the bottom of said top panel member to the top of said compressible frame member.

5,065,486

APPARATUS FOR FITTING FLEXIBLE STRIPS

Dieter Goedderz, Erkelenz, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Oct. 22, 1990, Ser. No. 601,878
Claims priority, application United Kingdom, Nov. 8, 1989, 8925206
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—235 24 Claims



1. A tool for fitting a length of channel-shaped strip onto a mounting flange or the like, comprising

a body portion,

strip engaging means carried by the body portion for engaging the outside surface of the strip when on the mounting flange and which includes at least one rotatable roller contacting the said surface of the strip,

support means for supporting the body portion,

motor means carried by the body portion for rotating the roller and thereby frictionally driving the body portion and the strip engaging means along the length of the strip on the flange, and

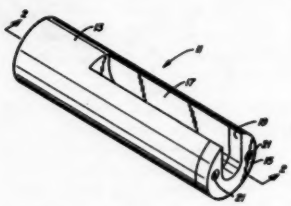
mounting means permitting relative angular movement between the body portion and the support means at a curve or bend in the flange, the relative angular movement being about an axis which is transverse to an spaced from the direction of extension of the flange.

5,065,487

OIL PUMP INSTALLATION TOOL

Cecil Yother, 1740 Timothy Dr., San Leandro, Calif. 94577

Filed Sep. 19, 1988, Ser. No. 245,697
Int. Cl.[5] B25B *27/14*
U.S. Cl. 29—275 **3 Claims**



1. An oil pump pickup tube installation tool comprising

a driver portion having a slot formed in one end thereof and extending for only a portion of the length of said driver, and

an end plate with the same peripheral configuration as said driver portion made of hardened metal removably secured to the slotted end of said driver and having a U-shaped notch formed therein and aligned with said slot.

5,065,488

TANDEM AXLE TRAILER PIN EXTRACTER DEVICE

Richard L. Chapman, 411 Kelley, P.O. Box 124, Waverly, Kans. 66871, and Lewis E. Barb, 1029 Janice, Emporia, Kans. 66801

Filed Mar. 21, 1990, Ser. No. 496,855
Int. Cl.[5] B25P *27/14*
U.S. Cl. 29—278 **1 Claim**

1. A portable, self-contained device for unattended extraction of lodged pins when repositioning a trailer body relative to tandem axles therebeneath, comprising;

(a) an elongate cylindrically-shaped body comprising a pair of diametrically opposed slots longitudinally disposed in sides thereof; each said slot having a non-biasing end near a base of aid body and a biasing end near the distal end of said body, said slots having a transverse, diametrically opposed extension at the biasing ends thereof;

(b) an engagement mechanism comprising a pair of hook-shaped sides; said hook-shaped sides rigidly displaced from each other at a distance which is slightly greater than the outside diameter of the body;

(c) a first sleeve and a second sleeve, each having an outside diameter which is slightly smaller than the inside diameter of said body; each said sleeve slidably secured within said body;

(d) a pair of alignment pins, each of which passes through said diametrically opposing slots, diametrically through said first sleeve, and through both hook-shaped sides, rigidly securing said hook-shaped sides to said first sleeve; said alignment pins slidably restrained to movement along said slots;

(e) a cocking mechanism comprising a pair of handles; said handles rigidly displaced from each other at a distance which is slightly greater than the outside diameter of the body; said handles substantially co-axially aligned with each other;

(f) a biasing pin which passes through said diametrically opposing slots, diametrically through said second sleeve, and rigidly secured to an end of each of said pair of handles, said biasing pin rigidly securing said handles to said second sleeve; said biasing pin slidably restrained to movement along said slots and said extensions thereof;

(g) a tension spring having an outside diameter which is smaller than the inside diameter of said body; said spring contained within said body; said spring having a first end secured to one of said alignment pins and a second end secured to said biasing pin; said spring having a spring constant sufficient to overcome a spring-loading of said pins when said pins are not lodged;

(h) said engagement mechanism having a first position whereat one of said alignment pins abuts the non-biasing ends of said slots and a second position, which is assumed by said engagement mechanism when secured to a release handle linked to extracted pins of the tandem axle trailer; and

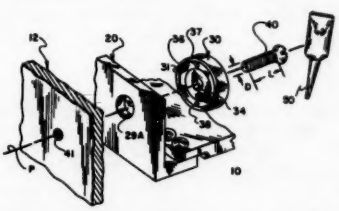
(i) said cocking mechanism having a first position whereat said engagement mechanism is substantially in its first position and a second position whereat said biasing pin has been rotated into said slot extensions and whereat said spring applies a force while said engagement mechanism moves from its said first position to its said second position, said force greater than that required to overcome a spring-loading of said pins when said pins are not lodged and to extract them from their locking position.

5,065,489

APPARATUS FOR ALIGNING AND MOUNTING MACHINE COMPONENTS

Charles E. Mullen, Spencerport, and Arthur H. Crater, Warsaw, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 28, 1988, Ser. No. 225,498
Int. Cl.[5] B25B *27/14*; F16B *39/02*
U.S. Cl. 29—281.5 **2 Claims**



1. An aligning member suitable for use in a method of aligning and mounting machine components such that the components can be removed, serviced and simply remounted without further need for realignment, the aligning member including:

a. first and second sides with generally flat surfaces suitable for mounting against a mounting portion of the machine component or against a bracket carrying the component;

b. a mounting hole that is formed through the aligning member from said first side through to said second side for

mounting the aligning member to a machine component support frame using a mounting screw or similar fastener;

c. a recess in said first side suitable for forming a cavity with a surface against which the aligning member is mounted; and

d. at least two perforations within said recess providing communication between said first side and said second side.

5,065,490

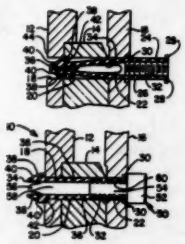
THREADED INSERT FOR REPAIRING A NUCLEAR ASSEMBLY

Adrian P. Wivagg, Tolland, and Kenneth A. Martin, Windsor, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 31, 1990, Ser. No. 531,219

Int. Cl.[5] B23P *6/00*

U.S. Cl. 29—402.17 **3 Claims**



1. A method of repairing a nuclear power facility metal component assembly with a fastening between hard metal parts comprising the steps of:

providing aligned non-cylindrically shaped openings in a plurality of hard metal parts to be assembled;

pushing into said openings an elongated hollow threaded bolt insert having a portion of cross-section complementarily shaped to that of the openings, said insert having a stop means, a shank and work retaining tabs;

said stop means including work engaging means to limit travel of the insert in the pushing direction;

said shank of said insert including internal insert threads adjacent said stop means and longitudinal slots defining flexing fingers which include said work retaining tabs on the ends thereof remote from said stop means;

said work retaining tabs including cam means on the outer surface portions thereof to flex said fingers inwardly during pushing and work engaging shoulders for engagement with the hard metal part remote from the stop means in the exposed marginal area surrounding the aligned opening of that remote part when said fingers are flexed outwardly with said tabs clear of the aligned openings;

providing a bolt with a torquing head, a shank with a leading end and adjacent pilot portion and a threaded portion between the pilot portion and the torquing head;

inserting said bolt into said hollow threaded bolt insert through the insert end adjacent said stop means, leading bolt end and pilot portion first, thereby to move and hold said flexing fingers in position with said work retaining tabs' work engaging shoulders in engagement with the hard metal part remote from the stop means;

torquing said bolt in said insert threads to fasten said hard metal parts together;

said shoulders being a distance from the stop means less than the combined length of the aligned openings of the metal parts such that in performing the step of torquing said bolt in said insert threads to fasten said hard metal parts together, the bolt head does not advance into contact with said insert.

5,065,491

METHOD FOR PRODUCING CURVED SLIDE FASTENER CHAINS AND METHOD FOR PRODUCING CURVED SLIDE FASTENERS

Shigeki Takada, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 12, 1989, Ser. No. 420,359

Claims priority, application Japan, Oct. 14, 1988, 63-257300

Int. Cl.[5] B21D *53/50*

U.S. Cl. 29—408 **9 Claims**

1. A method of producing curved slide fastener chains, consisting of the steps of: planting a plurality of fastener elements along respective edges opposite to each other of a pair of fastener tapes, at least one of which tapes is made of solvent-swelling fibers; inter-engaging the plurality of fastener elements on the respective tapes with each other thereby forming a fastener chain; applying a solvent onto said at least one of said pair of fastener tapes made of solvent-swelling fibers, thereby causing said at least one of said pair of fastener tapes to swell and form at least one solvent-swelled tape; subsequently shaping this fastener chain into a desired curved configuration by selectively lengthening at least a portion of said at least one solvent-swelled tape with respect to an opposite portion of the respective opposite tape thereby forming a curved fastener chain; and thereafter sewing the curved fastener chain onto a texture.

5,065,492

METHOD OF AND ASSEMBLY FOR RELEASABLY CONNECTING A TOOL HEAD TO A TOOL BASE HOLDER OF A TOOL TURRET MACHINE TOOL

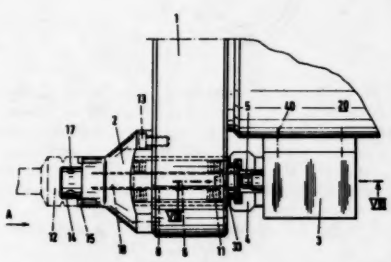
Rainer Von Haas, Geestnacht, and Hans Tack, Velberg, both of Fed. Rep. of Germany, assignors to Krupp Widia GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 29, 1989, Ser. No. 414,898

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833511

Int. Cl.[5] B23B *29/04*

U.S. Cl. 29—426.6 **13 Claims**



1. A method of operating a tool-mounting assembly for a machine tool in which said assembly comprises:

a tool head adapted to be releasably received in said assembly;

a tool turret;

a tool base holder mounted on said tool turret releasably receiving said tool head and formed with a mechanism engageable with said tool head for retaining said tool head on said tool base holder, said tool base holder being formed with a tool shaft having a shoulder at an end opposite an end of said tool base holder receiving said tool head and being rotatable on said tool turret into a position in which said shoulder is engaged by a pair of jaws; and

a tension rod displaceable axially relative to said tool base holder and operatively connected with said mechanism for actuating same to selectively retain and release said tool head; and

a disk-spring stack bearing upon said rod for applying stress thereto to bias said rod into a position in which said mechanism retains said tool head on said tool base holder,

said method comprising the steps of:

(a) pressing said rod in a direction opposite the direction in which said rod is biased by said disk-spring stack with a force sufficient to overcome the force applied by said disk-spring stack to said rod to operate said mechanism to release said tool head;

(b) simultaneously with step (a) applying to said tool base holder an external counterforce substantially equal to said force sufficient to overcome the force applied by said disk-spring stack to said rod in said direction in which said rod is biased, thereby relieving said tool turret from tool release forces, said force being sufficient to overcome the force applied by said disk-spring stack to said rod and being applied to an end face of said rod passing through said shaft by a piston rod of a piston displaceable in a cylinder movable in a direction opposite said piston by fluid pressurization of said cylinder and operatively connected with said jaws adapted to exert said counterforce and located in a fixed position relative to a rotatable casing of said tool turret; and

(c) removing said tool head from said tool base holder.

5,065,493

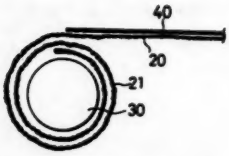
METHOD OF MAKING A SPHERICAL SEALING BODY USED FOR EXHAUST PIPE JOINT

Kazuo Ozora, Fujisawa, Japan, assignor to Oiles Corporation, Tokyo, Japan

Division of Ser. No. 430,363, Nov. 2, 1989. This application Mar. 25, 1991, Ser. No. 674,190

Int. Cl.[5] B21D *39/00;* **B23P** *11/00;* **B32B** *31/04;* **F16L** *19/02*

U.S. Cl. 29—505 **6 Claims**



1. A method of manufacturing a spherical sealing body which is to be inserted in a space defined by an end edge portion of a first section of an exhaust pipe, a flange fixed on an outer periphery of said first section of said exhaust pipe, and a concave spherical portion disposed on an end edge of a second section of said exhaust pipe downstream from said first section, comprising the steps of;

preparing a wire mesh by weaving or knitting a fine metal wire;

winding said wire mesh in at least two turns about a cylinder to thereby form a partial cylindrical part;

placing a refractory material sheet, wider than said wire mesh, over a part of said wire mesh extending from said partial cylindrical part such that said wider refractory material sheet projects from one side of said wire mesh;

winding about said partial cylindrical part said part of said wire mesh having said refractory material sheet thereon, to thereby form a preform body with said refractory material sheet projecting from said one side of said wire mesh and therefore from one end of said partial cylindrical part; and

compressing said preform body from an outer circumferential side of said preform body and also from said one end of said partial cylindrical part to thereby form said spherical sealing body having said refractory material sheet filled in meshes and clearances of said wire mesh at said circumferential side of said preform body and having said projecting refractory material sheet compressed over said one end of said partial cylindrical part and filled in said meshes and clearances of said wire mesh at said one end of said partial cylindrical part.

5,065,494

METHOD OF SECURING FASTENER

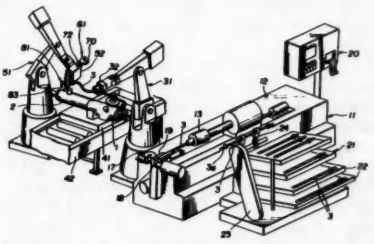
Yasuhiro Ebihara, Fujisawa; Hiroyuki Sakaniwa, Kawasaki, and Hiroshi Saito, Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Division of Ser. No. 329,222, Mar. 27, 1989, Pat. No. 4,967,472. This application Jun. 6, 1990, Ser. No. 534,616

Claims priority, application Japan, Mar. 28, 1988, 63-71781

Int. Cl.[5] B23P *19/06*

U.S. Cl. 29—525.2 **5 Claims**



1. A method of tightening a tapped member, comprising the steps of:

coupling first coupling means with the tapped member;

rotating said first coupling means in a first rotational direction to tighten the tapped member to a first predetermined torque when said first coupling means couples with the tapped member;

rotating said first coupling means in a second rotational direction opposite to said first rotational direction after said first coupling means being disengaged from the tapped member and after having tightened the tapped member to said first predetermined torque until said first coupling means takes a predetermined position;

detecting an angle of rotation of said first coupling means in said second rotational direction until said predetermined position and generating a rotational angle indicative signal indicative of said detected angle of rotation;

coupling second coupling means with the tapped member in response to said rotational angle indicative signal; and

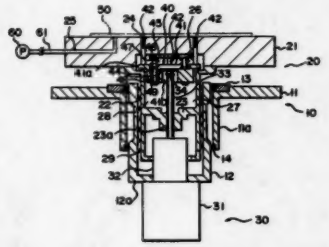
rotating said second coupling means in said first rotational direction to tighten the tapped member firmly to a second predetermined torque that is greater than said first predetermined torque.

5,065,495

METHOD FOR HOLDING A PLATE-LIKE MEMBER

Masaki Narushima, and Itaru Takao, both of Yamanashi, Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Division of Ser. No. 281,224, Dec. 8, 1988, Pat. No. 4,955,590.
This application Jun. 8, 1990, Ser. No. 534,258
Claims priority, application Japan, Jun. 10, 1987, 62-144926
Int. Cl.[5] B25B *11/00*
U.S. Cl. 29—559 2 Claims



1. A receiving method for receiving a plate-like member in a receiving apparatus having a vertically movable table member and at least three pins which project and retract upon vertical movement of said table member, comprising the steps of:

moving said table member downward to cause said pins to project from said table member;

placing said plate-like member on said pins; and

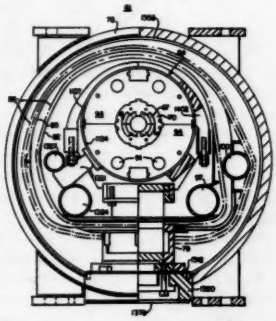
moving said table member upward to conceal said pins under said table member, thereby receiving said plate-like member on said table member.

5,065,496

PROCESS FOR MAKING A SUPERCONDUCTING MAGNET COIL ASSEMBLY FOR PARTICLE ACCELERATORS

Andrew J. Jarabak, Pittsburgh; Wallace H. Sunderman, McCandless Twp., Allegheny County; Edward G. Mendola, Fallowfield Twp., Washington County, and Ralph W. Kalkbrenner, Hempfield Twp., Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 360,192, Jun. 1, 1989. This application Oct. 30, 1990, Ser. No. 605,864
Int. Cl.[5] H01L *39/24*
U.S. Cl. 29—599 12 Claims



1. A method of assembling a superconducting dipole magnet, the method comprising the steps of:

providing a cold mass assembly comprised of a collared superconducting coil subassembly, rigidly secured within a shell assembly;

providing a first generally cylindrical heat shield adapted to receive the cold mass assembly therein;

providing a second generally cylindrical heat shield adapted to receive the first heat shield therein;

providing a vacuum vessel adapted to receive the second heat shield; and

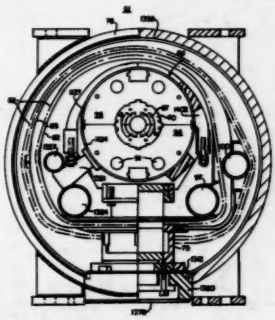
placing the cold mass assembly within the first heat shield, the first heat shield with the cold mass assembly therein within the second heat shield, and the second heat shield with the first heat shield and cold mass assembly therein within the vacuum vessel, whereby a superconducting magnet is assembled.

5,065,497

APPARATUS FOR MAKING A SUPERCONDUCTING MAGNET FOR PARTICLE ACCELERATORS

Andrew J. Jarabak, Pittsburgh; Wallace H. Sunderman, McCandless Township, Allegheny County; Edward G. Mendola, Fallowfield Township, Washington County, and Ralph W. Kalkbrenner, Hempfield Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 360,192, Jun. 1, 1989. This application Oct. 30, 1990, Ser. No. 605,809
Int. Cl.[5] H01F *41/02*
U.S. Cl. 29—564.7 16 Claims



1. Apparatus for assembling a superconducting magnet, said apparatus comprising:

means for winding a coil of superconducting material;

means for pressing and curing said coil made of superconducting material;

means for assembling a collaring assembly to secure the superconducting coil about a tubular member;

means for forming and pressing a collared coil for the superconducting magnet;

means for constructing a yoke assembly for the superconducting material; and

means for assembling a cold mass for the superconducting magnet.

5,065,498

MULTIPLE BIT POWER DRILL

Archibald M. McKenzie, 212 Hiawatha Dr., West Vancouver, B.C., Canada V7P 1E1

Filed Apr. 5, 1990, Ser. No. 505,675
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 16 Claims

1. A multiple bit power drill comprising:

a) a housing;

b) a cylindrical magazine mounted in said housing for rotation about a longitudinal axis, said magazine provided with an array of parallel longitudinal bores open at either end thereof;

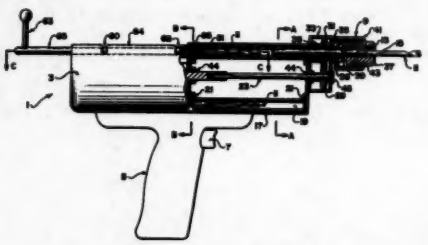
c) a plurality of drill bit elements, each said bit element being

removably located in one of said bores, each said bit element having a drill bit at one end and a surface perpendicular to the length of the bit at the opposite end, and an annular groove formed in the bit element transversely to the length of the bit adjacent the opposite end;

c) a chuck assembly having a central bore for receiving a drill bit element and means for releasably securing said bit element in said assembly;

d) motor means for rotating said chuck assembly; and

e) means for ejecting one of said drill bit elements from a bore and inserting said bit element into said bore in said chuck assembly, said ejection means being movable between a first rearward position withdrawn from said magazine and in which said magazine is free to rotate, to a second forward position in which said ejection means extends through one of said bores in said magazine to push a bit element out of said bore, said ejection means comprising a surface for contacting the end surface of said bit



element and a hook element which is adapted to pass freely through said groove of said bit element in the direction transverse to the length of said bit element when said ejection means is in said first position, and to bear against the rearward surface of said groove of said bit element when said ejection means is moved from said second position to said first position;

wherein said housing comprises a bit guiding means fixed to said housing and adapted to extend into said grooves of said drill bit elements when said drill bit elements are located in said bores, said guiding means provided with an aperture in the vicinity of said ejection means to allow passage of said ejection means through said guiding means, whereby said groove of a bit element is engaged by said guiding means when said magazine is rotated to guide said bit element into a position wherein said hook element of said ejection means is located in said groove when said bit element is adjacent said aperture and said ejection means is in said first position.

5,065,499

APPARATUS FOR MAKING ELECTRIC MOTOR PARTS EMPLOYING PALLET WITH REMOVABLE WORKPIECE HOLDER

Santandrea Luciano, and Lombardi Massimo, both of Florence, Italy, assignors to Axis S.p.A., Florence, Italy

Division of Ser. No. 326,012, Mar. 20, 1989, Pat. No. 4,965,924. This application Oct. 1, 1990, Ser. No. 591,272

Claims priority, application Italy, Dec. 16, 1988, 68113 A/88

Int. Cl.[5] B23D *19/00*

U.S. Cl. 29—799 **8 Claims**

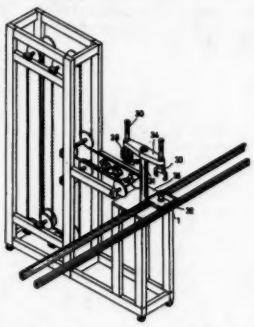
1. Apparatus for supporting any one of a plurality of differently configured workpieces during work on said one of said workpieces comprising:

a pallet member;

storage means for storing a plurality of said workpiece holders;

means disposed on said pallet for releasably engaging any of said workpiece holders at the pallet-engaging site of the engaged workpiece holder so that the engaged workpiece holder can hold a workpiece at its workpiece-engaging site;

means for selectively operating said means for releasably engaging to release a workpiece holder from said pallet;



means for removing the released workpiece holder from said pallet and storing it in said storage means; and

means for removing a workpiece holder from said storage means and positioning it on said pallet for engagement by said means for releasably engaging.

5,065,500

METHOD OF MANUFACTURING A MAGNETIC HEAD ASSEMBLY INCLUDING A MAGNETIC RECORDING MEDIUM SLIDE SURFACE HAVING GROOVES FORMED THEREON

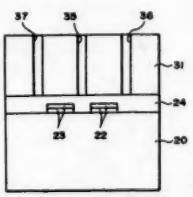
Kou Yoneda, Machida, and Takeshi Sawada, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 284,816, Dec. 14, 1988, abandoned, which is a continuation of Ser. No. 901,779, Aug. 29, 1986, abandoned. This application Jun. 12, 1990, Ser. No. 537,143

Claims priority, application Japan, Sep. 5, 1985, 60-194930

Int. Cl.[5] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A method of manufacturing a magnetic head assembly, said method comprising the steps of:

preparing a base plate having a sliding surface on which a magnetic recording medium slides and a joining surface substantially perpendicular to the sliding surface;

forming a magnetic core on the joining surface of the base plate, the magnetic core including a pair of magnetic thin films having a magnetic gap therebetween;

preparing a reinforcing member having a sliding surface on which the magnetic recording medium slides and a joining surface substantially perpendicular to the sliding surface of the reinforcing member;

forming a plurality of grooves on the sliding surface of the reinforcing member, the plurality of grooves extending in a direction substantially parallel to the direction in which the magnetic recording medium slides;

aligning the sliding surface of the base plate with the sliding surface of the reinforcing member and arranging the mag-

netic core between the joining surface of the base plate and the joining surface of the reinforcing member; and

joining, subsequent to the step of forming the plurality of grooves on the sliding surface of the reinforcing member, the base plate, having the joining surface on which the magnetic core has been formed, to the reinforcing member, having the sliding surface on which the plurality of grooves have been previously formed.

5,065,501

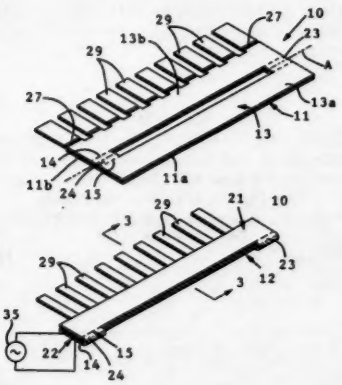
GENERATING ELECTROMAGNETIC FIELDS IN A SELF REGULATING TEMPERATURE HEATER BY POSITIONING OF A CURRENT RETURN BUS

Homer E. Henschen, Carlisle; Michael J. McKee, New Cumberland, and Joseph M. Pawlikowski, Lancaster, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 277,170, Nov. 29, 1988, Pat. No. 4,990,736. This application Oct. 31, 1990, Ser. No. 606,253

Int. Cl.[5] H05B *3/00*

U.S. Cl. 29—611 **9 Claims**



6. A method for fabricating a self-regulating heater of the type that is energized by an alternating current having a known frequency, said method comprising the steps of:

(a) fixedly disposing a magnetic material surface layer on at least a portion of a surface of a non-magnetic, electrically-conductive substrate, said magnetic material having a substantially higher resistance than said substrate, said surface layer having a depth corresponding approximately to one skin depth of said magnetic material at said known frequency;

(b) defining a slot through the entire thickness of said substrate with at least one fold section joining first and second heater sections; and

(c) folding the substrate through the at least one fold section and slot such that the first and second heater sections are closely spaced and substantially parallel and in which said surface of said first heater section faces said surface of said second heater section.

5,065,502

METHOD FOR MODIFYING ELECTRICAL PERFORMANCE CHARACTERISTICS OF CIRCUIT PATHS ON CIRCUIT PANELS

Philip A. Amante, Pelham, N.H., assignor to Lucas Duralith Art Corporation, Millville, N.J.

Filed Sep. 30, 1988, Ser. No. 252,192

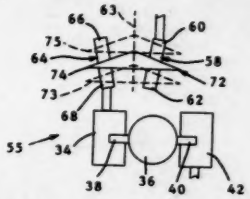
Int. Cl.[5] H01C *17/06*

U.S. Cl. 29—620 **9 Claims**

9. A method of sequentially printing an electrical component onto a substrate, said electrical component having an electrical characteristic, said method comprising the steps of:

printing a pair of conductive path elements on said substrate;

printing a third conductive path element at one of a location and an orientation with respect to said pair of conductive path elements, where, at said one of a location and orientation, said three conductive path elements have an electrical characteristic;



measuring said electrical characteristic of said three conductive path elements;

comparing said measured characteristic with a desired electrical characteristic; and

adjusting at least one of said location and said orientation for subsequent third consecutive path element printing steps such that the measured characteristics in subsequent electrical components is a function of said desired electrical characteristic.

5,065,503

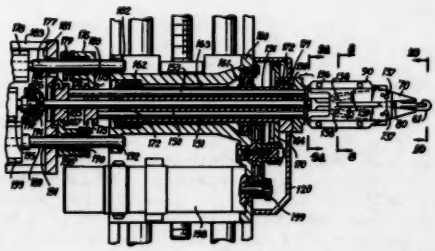
APPARATUS FOR CONNECTING STATOR COIL LEADS

Sabatino Luciani, and Antonio Lumini, both of Florene, Italy, assignors to Axis, U.S.A., Inc., Marlborough, Mass.

Filed Aug. 1, 1990, Ser. No. 561,965

Int. Cl.[5] B23P *19/00*

U.S. Cl. 29—735 **20 Claims**



1. Apparatus for connecting a lead wire extending from a coil portion wound on a stator pole of a stator core to at least one of a plurality of terminal means located on a stator terminal board affixed to said stator core, each one of said plurality of terminal means having a different location and angular orientation on said stator terminal board, said apparatus comprising:

a. a wire handling device for grasping and removing said lead wire from a temporary anchoring gripper;

b. means for translating and rotating said wire handling device to dispose said lead wire along a complex path so that said lead wire is aligned with and partially engaged in any one of said terminal means;

c. means for fully engaging said lead wire with said terminal means; and

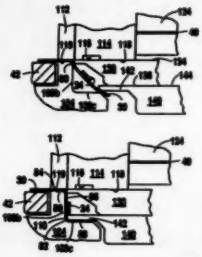
d. means for severing said lead wire at a point beyond the engagement of said lead wire with said terminal means, whereby said lead wire is connected to said terminal means.

5,065,504

METHOD OF FORMING FLEXIBLE METAL LEADS ON INTEGRATED CIRCUITS

Michael A. Olla, Austin, Tex., assignor to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Nov. 5, 1990, Ser. No. 608,769
Int. Cl.[5] H01R 43/00; B23P 25/00
U.S. Cl. 29—827 20 Claims



1. A method of forming a plurality of flexible metal leads connected to an integrated circuit chip which extend beyond the outer periphery of the chip and terminate at outer lead ends, comprising:

aligning a first portion of the leads between the top of a lead form anvil and the bottom of a clamp, wherein the first portion begins at a first end adjacent to the chip outer periphery and ends at a second end between the chip outer periphery and the outer lead ends,

actuating the clamp toward the anvil to releasably secure the second end of the first portion of the leads between the clamp and the anvil,

actuating a first punch toward the leads so that the first punch contacts the second ends of the first portion of the leads and bends the leads at a first lead corner toward the anvil,

actuating a second punch toward the leads so that an abutment on the second punch contacts the leads at or near the first lead corners and releasably secures the leads against the anvil,

actuating a third punch toward the leads after the second punch releasably secures the leads so that an abutment on the third punch contacts the leads between the first lead corners and the outer lead ends and forces the leads toward the anvil, the bottom of the leads slide against the anvil, and the top of the leads slide against the abutment on the third punch,

continuing to actuate the third punch so that a second corner of the leads is releasably secured between the abutment on the third punch and a corner of the anvil, thereby forming a second portion of the leads with a first end at the first lead corner and a second end at the second lead corner, and a third portion of the leads with a first end at the second lead corner and a second end at the outer lead ends, and

retracting the clamp, first punch, second punch and third punch so that the leads are released, thereby slide forming the leads.

20. An apparatus for forming a plurality of flexible metal leads connected to an integrated circuit chip which extend beyond the outer periphery of the chip and terminate at outer lead ends, comprising:

means for aligning a first portion of the leads between the top of a lead form anvil and the bottom of a clamp, wherein the first portion begins at a first end adjacent to the chip outer periphery and ends at a second end between the chip outer periphery and the outer lead ends,

means for actuating the clamp toward the anvil to releasably secure the second end of the first portion of the leads between the clamp and the anvil,

means for actuating a first punch toward the leads so that the first punch contacts the second ends of the first portion of the leads and bends the leads at a first lead corner toward the anvil,

means for actuating a second punch toward the leads so that an abutment on the second punch contacts the leads at or near the first lead corners and releasably secures the leads against the anvil,

means for actuating a third punch toward the leads after the second punch releasably secures the leads so that an abutment on the third punch contacts the leads between the first lead corners and the outer lead ends and forces the leads toward the anvil, the bottom of the leads slide against the anvil, and the top of the leads slide against the abutment on the third punch,

means for continuing to actuate the third punch so that a second corner of the leads is releasably secured between the abutment on the third punch and a corner of the anvil, thereby forming a second portion of the leads with a first end at the first lead corner and a second end at the second lead corner, and a third portion of the leads with a first end at the second lead corner and a second end at the outer lead ends, and

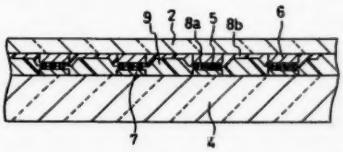
means for retracting the clamp, first punch, second punch and third punch so that the leads are released, thereby slide forming the leads.

5,065,505

METHOD FOR CONNECTING CIRCUIT BOARDS

Hiroshi Matsubara, and Takashi Nukii, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 10, 1990, Ser. No. 595,086
Claims priority, application Japan, Oct. 17, 1989, 1-271072
Int. Cl.[5] H05K 3/36
U.S. Cl. 29—830 10 Claims



1. In a method for connecting circuit boards in which a first circuit board having a first surface comprising first electrodes and first residual regions on which said first electrodes are not formed is superposed on a second circuit board having a second surface comprising second electrodes and second residual regions on which said second electrodes are not formed wherein said second electrodes are formed in positions corresponding to the first electrodes so that the first and second electrodes are electrically connected with each other, the method comprising:

a first step of applying a photocuring adhesive on the first electrodes and the first residual regions;

a second step of irradiating light through the first circuit board from a surface opposite the first surface so as to cure the photocuring adhesive on the first residual regions of the first circuit board while leaving uncured the photocuring adhesive on the first electrodes;

a third step of adhering particles which are conductive at least on their outer peripheral surfaces to the first electrodes by means of the uncured photocuring adhesive; and

a fourth step of superposing the first circuit board to which the particles are adhered on the second circuit board to electrically connect the first and second electrodes with each other through the particles,

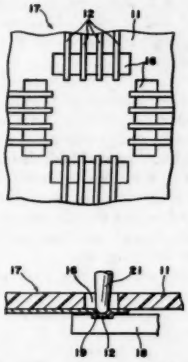
provided that the first electrodes are opaque and the first circuit board is light-transmissive.

5,065,506

METHOD OF MANUFACTURING CIRCUIT BOARD

Shoji Kiribayashi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1990, Ser. No. 590,790
Claims priority, application Japan, Oct. 5, 1989, 1-261693
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—632 4 Claims



1. A method of manufacturing a circuit board mounted with an LSI chip, comprising the steps of:

providing an electric conductor on one surface of an electrically insulating substrate made of flexible synthetic resin;

selectively irradiating onto the other surface of the substrate a laser beam having a temperature for sublimating at least the substrate so as to form an opening on the substrate;

providing the LSI chip on the one surface of the substrate at a location corresponding to the opening and the electric conductor; and

electrically connecting the LSI chip and the electric conductor by using an ultrasonic head from the other surface of the substrate through the opening.

5,065,507

METHOD FOR INSTALLING BEARINGS ON ENGINE COMPONENTS

Takehisa Wakamori, Hidaka; Takashi Ogawa, Kurume; Ryoji Ito, Kawagoe, and Chikafumi Shimanaka, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 915,275, Oct. 3, 1986, Pat. No. 4,872,257.
This application Jun. 28, 1989, Ser. No. 372,610
Claims priority, application Japan, Oct. 4, 1985, 60-222568; Oct. 7, 1985, 60-224204; Oct. 7, 1985, 60-224205; Oct. 9, 1985, 60-225831; Oct. 16, 1985, 60-158134[U]; Dec. 2, 1985, 60-271152; Dec. 2, 1985, 60-271153; Dec. 27, 1985, 60-295778
Int. Cl.[5] B23Q *17/00*
U.S. Cl. 29—888.01 6 Claims

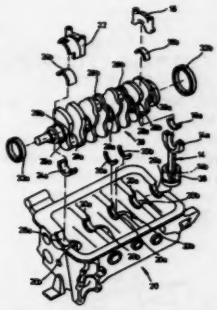
1. A method for assembling a bearing including first and second substantially semicylindrically shaped members in an internal combustion engine comprising engine components of connecting rods, connecting rod caps, a crankshaft and cylinder block, said engine components and said first and second substantially semicylindrically shaped members having variable dimensions, comprising the steps of:

reading out dimensional data marked on the engine components wherein a bearing having first and second substantially semicylindrically shaped members are to be installed, wherein said step of reading out dimensional data comprises:

reading data in the form of bar code marks marked on the engine component; providing the bar code marks on the engine component at intervals dependent on the number of the bar code marks; measuring a time interval required from the time to start to read the bar code marks until the first bar code mark is read and a time interval required until adjacent bar code marks are read; and determining whether the number of the bar code marks is correctly read by comparing said time interval with a reference time established according to the number of the bar code marks;

memorizing said dimensional data read out in said reading out step;

selecting said first and second members corresponding to said engine components on the basis of the correctly read bar code marks on the engine component and the memorized dimensional data;



positioning said first substantially semicyclindrically shaped member to be installed in a connecting rod such that a convex side thereof is downwardly oriented, and positioning said second substantially semicylindrically shaped member to be installed in a connecting rod cap such that a convex side thereof is upwardly oriented; and

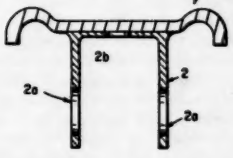
installing said first substantially semicylindrically shaped member on said connecting rod, said connecting rod being assembled together with said cylinder block, such that the convex side of said first substantially semicylindrically shaped member is downwardly positioned on said connecting rod, and installing said second substantially semicylindrically shaped member in said connecting rod cap such that the convex side thereof is upwardly positioned in said connecting rod cap.

5,065,508

TWO-PIECE PISTON AND METHOD OF MANUFACTURING THE SAME

Gustavo F. Lorento; José A. C. Mendes, both of São Paulo, Brazil, and João A. D. Cullen, Ann Arbor, Mich., assignors to Metal Leve S.A. Industria E Comercio, São Paulo, Brazil

Filed Oct. 19, 1989, Ser. No. 423,119
Claims priority, application Brazil, Oct. 26, 1988, 8805716
Int. Cl.[5] B23P *15/10*
U.S. Cl. 29—888.042 9 Claims



1. A method for manufacturing a two-piece piston for internal combustion engines, including a head having dependent

therefrom a pair of pin bosses for bearing a piston wrist pin, and a skirt portion, comprising the steps of:

forming a top portion comprising a circular upper plate and a substantially cylindrical leg depending from a periphery of said plate, said circular plate having an outer face and an inner face;

forming a U-shaped pin boss portion, said boss portion including a base having ends and a pair of arms respectively connected at opposite ends of said base, said arms having holes for a wrist pin, the distance between said arms being less than the diameter of said top portion;

positioning the base of said boss portion within said cylindrical leg;

welding said base to said inner face of said top portion; and

machining at least a portion of said substantially cylindrical leg and said wrist pin holes.

5,065,509

METHOD OF SECURING A BLADE FOR A TORQUE CONVERTER

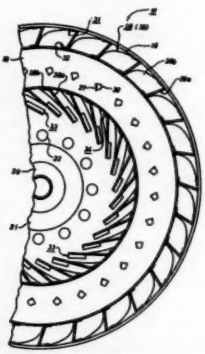
Masayoshi Sahashi, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 408,338, Sep. 18, 1989. This application Aug. 10, 1990, Ser. No. 565,089

Claims priority, application Japan, Sep. 29, 1988, 63-127660

Int. Cl.[5] F16D *33/00*

U.S. Cl. 29—889.21 **1 Claim**



1. A method for securing blades to a shell and a core ring for use in a torque converter, said shell and said core ring having slits spaced in aligned radial rows on said shell and said core ring, said aligned radial rows being equally spaced in a circumferential direction therearound and extending therethrough for receiving tabs at the opposite edges of said blades positioned and secured therebetween, said shell having a concave inner surface and said core ring having a convex outer surface for contact with opposite outer and inner edges, respectively, of said blades, the steps comprising:

forming a plurality of blades, each blade having a convex outer edge conforming to said concave inner surface of said shell and a concave inner edge conforming to said convex outer surface of said core ring, a plurality of tabs extending outwardly from said outer and inner edges for insertion through said slits in said shell and said core, respectively, and outwardly extending ribs at the opposite ends of said convex outer edge and said concave inner edge of said blades, said ribs at the opposite ends of said convex outer edge of said blades extending in an opposite direction from said ribs at the opposite ends of said concave inner edge of said blades, each of said ribs on said convex outer edge of each of said blades having a convex outer surface aligned with said convex outer edge of said each of said blades and each of said ribs on said concave inner edge of each of said blades having a concave inner surface aligned with said concave inner edge of said each of said blades;

positioning said blades, one blade after the other, in said shell with said convex outer edge of said blade and said aligned convex outer surface of said ribs in contact with said concave inner surface of said shell and said tabs on said convex outer blade edge extending through said slits in a circumferentially spaced, aligned radial row of said aligned radial rows, bending the projecting ends of said tabs extending through said slits into contact with an outer surface of said sheli, and continuing said positioning, said contacting and said bending of said tab projections until all of said aligned radial rows of slits to receive blades have been filled;

positioning said convex outer surface of said core ring on said concave inner edge of said blades positioned in said shell with said projections on said inner edges of said blades extending through said slits in said core ring and said concave inner edges of said blades and said concave inner surfaces of said ribs at the opposite ends of said blades in contact with said convex outer surface of said core ring, and bending the projecting ends of said tabs extending through said slits into contact with an inner surface of said core ring; and

brazing said blades, with said ribs, to said shell and said core ring.

5,065,510

METHOD FOR THE MANUFACTURE OF A LIGHT METAL VEHICLE WHEEL

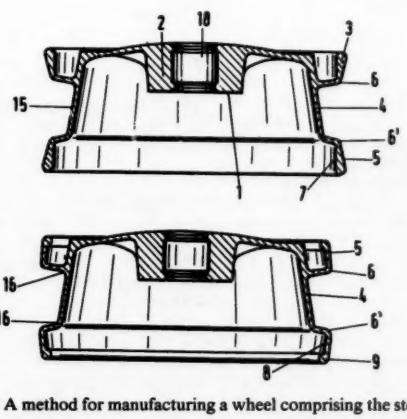
Friedrich Ostermann, Meckenheim-merl; Hans-Heinrich Plath, Niederk-Mondorf, and Winfried Griep, Bonn, all of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,434

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733348

Int. Cl.[5] B21B *1/02*; B21K *1/32*

U.S. Cl. 29—894.324 **12 Claims**



1. A method for manufacturing a wheel comprising the steps of:

pushing radially inward a club-shaped thickened portion of a rim so that as the club-shaped thickened portion extends axially outward to terminate at an outer end, the club-shaped thickened portion inclines radially inward, the club-shaped thickened portion having an outer surface formed as a tread for use during a flat; and

undercutting a portion of the radially inner surface of the club-shaped thickened portion next to the outer end of the rim so as to form the outer end into a rim horn that is thicker than said portion that is undercut and extends

further inward radially than does said portion that is undercut.

5,065,511

METHOD OF MOUNTING SAW-TOOTH WIRES ONTO A ROLLER FOR TEXTILE MACHINES

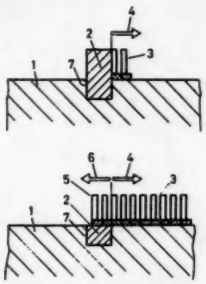
Ralph Graf, Freienbach, Switzerland, assignor to Graf & Cie AG, Rapperswil, Switzerland

Filed Apr. 5, 1991, Ser. No. 681,182

Claims priority, application Switzerland, Jun. 26, 1990, 2128/90

Int. Cl.[5] B21H *1/14*

U.S. Cl. 29—895.211 6 Claims



1. A method of mounting saw-tooth wires onto a roller for textile machines which is to be equipped with a card clothing, comprising the steps

of providing a roller having a smooth surface;

of mounting a guide member onto the roller along a circumferential area located distant from both ends thereof;

of placing an end of at least one first saw-tooth wire section against one side of said guide member and connecting it thereto;

of winding said at least one first saw-tooth wire section onto a first part of said roller adjacent the mentioned side of the guide member to which said first saw-tooth wire section has been connected to, which winding is performed such that at least a section of the first turn of the winding is guided by said guide member and any subsequent turn of the winding is guided by at least a portion of a respective preceding turn thereof;

of removing said guide member at least partially and of connecting an end of at least one second saw-tooth wire section to at least one section of said first turn of the respective first saw-tooth wire section;

of winding said at least one second saw-tooth wire section around a second, as yet not wound section of said roller, which winding is performed such that at least a section of the first turn of the winding of said second saw-tooth wire section is guide by at least a section of the first turn of said first saw-tooth wire section and any subsequent turn of the winding of said second saw-tooth wire section is guided by at least a portion of a respective preceding turn thereof.

5,065,512

METHOD OF MAKING A BEARING FOR SPINDLES OF SPINNING OR TWISTING MACHINES

Hans Stahlecker, Süssen, Fed. Rep. of Germany, assignor to Fritz Stahlecker, Fed. Rep. of Germany, a part interest

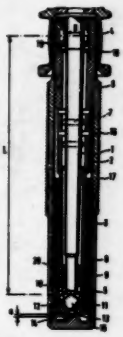
Continuation of Ser. No. 365,716, Jun. 14, 1989, abandoned. This application Nov. 7, 1989, Ser. No. 432,844

Int. Cl.[5] B23P *11/00*; B21K *1/04*

U.S. Cl. 29—898.09 12 Claims

1. A process for manufacturing a bearing for spindles of spinning of twisting machines, said bearing including a spindle bearing housing, a bolster contained in the spindle bearing housing and surrounding a bolster bearing for engagably supporting a spindle shaft at its circumference, a step pivot bearing for engagably supporting an end of a spindle shaft, a centering tube fastened to the spindle bearing housing in proximity to the bolster and including means for holding the step pivot bearing, said centering tube having interior surfaces, and a step bearing sleeve having interior and exterior surfaces, said sleeve is held in the centering tube and serving to radially locate a section of a spindle adjacent its end supported at the step pivot bearing, said process comprising:

mounting the step bearing sleeve in the centering tube, and subsequently adjusting radial step bearing play of the step



bearing sleeve with respect to a spindle to be supported thereat while the step bearing sleeve is mounted in the centering tube by machining radially interior surfaces of the step bearing sleeve,

whereby tolerance deviations at the centering tube and mounting tolerances for the step bearing sleeve at the centering tube do not adversely affect the step bearing play adjustment while permitting economical manufacture of the bearing.

5,065,513

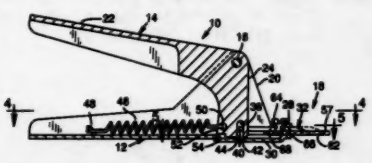
ARTIFICIAL FINGERNAIL CLIPPER

Gary J. Reiswig, 17190 SW. 131st, Tigard, Oreg. 97224

Filed Sep. 20, 1990, Ser. No. 585,484

Int. Cl.[5] A45D *29/02*

U.S. Cl. 30—29 9 Claims



1. A fingernail clipper comprising:

a cutting end including a stationary nail holder having an aperture therein for receiving a fingernail, a cutting blade slidably disposed against and above the nail holder, the cutting blade having a rear end and a cutting edge, and a blade mounting member which extends past the cutting blade and is secured to the nail holder; and

an operating mechanism including a stationary handle extending rearwardly from the cutting end and a pivotable handle pivotally mounted to the stationary handle, the pivotable handle having a pushing edge in direct contact with the cutting blade such that upon pivoting of the pivotable handle in a cutting direction, the pushing edge urges the cutting blade forward over the aperture in the nail holder to effect cutting of the fingernail, an upward force being exerted on the rear end of the cutting blade by the pivotable handle upon pivoting the pivotable handle in

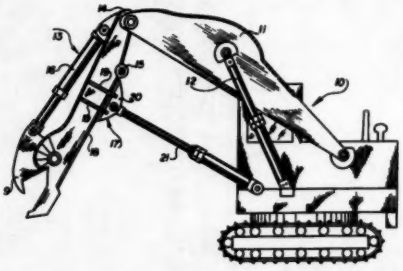
the cutting direction, the force increasing as the pivotable handle pivots in the cutting direction.

5,065,514

ATTACHMENT FOR METAL DEMOLITION SHEARS

Sol N. Gross, North Versailles, Pa., assignor to Ace Demolition Incorporated, N. Versailles, Pa.

Filed Sep. 25, 1990, Ser. No. 587,412
Int. Cl.[5] B26B *1/00*
U.S. Cl. 30—134 **8 Claims**



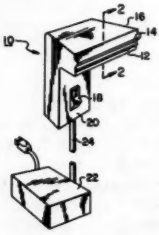
1. An attachment means for attaching a heavy duty shear to a shovel front end loader, said shear having a lower surface and two substantially parallel sides, said shear further having a forward end and a rearward end, said attachment means having means for securely fastening said attachment means to the lower surface of said heavy duty shear, said attachment means including two substantially parallel side brackets having substantially similarly sized holes line bored therethrough for receiving a cylinder pin for providing pivotal attachment of said attachment means to a lower hydraulic cylinder from said front end loader, such that said lower cylinder can raise and lower said shear, said attachment means adapted to be positioned between said rearward end and said forward end of said heavy duty shear on the lower surface of said heavy duty shear.

5,065,515

THERMALLY ASSISTED SHAVING SYSTEM

Richard A. Iderosa, West Haven, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 24, 1991, Ser. No. 647,162
Int. Cl.[5] A61B *17/00*; B26B *1/00*
U.S. Cl. 30—140 **17 Claims**



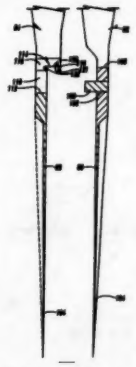
1. A device for shaving hair, which comprises:
a housing;
a blade mounted on said housing, said blade having a linear cutting edge projecting from said housing for cutting said hair; and
a heating means mounted on said housing, said heating means having an elongated edge projecting from said housing and disposed substantially parallel to said blade cutting edge for heating said hair prior to cutting of said hair by said cutting edge.

5,065,516

DISASSEMBLABLE SCISSORS MEANS

David H. Dulebohn, Tonka Bay, Minn., assignor to Andrew Tool Company, Plymouth, Minn.

Continuation-in-part of Ser. No. 49,109, May 11, 1987, abandoned. This application Nov. 6, 1989, Ser. No. 433,019
Int. Cl.[5] B26B *13/00*
U.S. Cl. 30—245 **5 Claims**



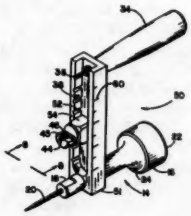
5. A disassemblable scissors means comprising:
a pair of opposing, pivoted arms having scissors blades and opposed handles on opposite sides of a pivot point;
a pivot means associated with the arms forming the pivot point, the pivot means allowing releasable assembly of the arms;
a retaining means associated with the arms for disallowing separation of the arms when assembled unless the arms are pivoted with respect to one another to at least an approximate perpendicular orientation;
said retaining means comprising a male member which is a portion of one arm, and a female member which is a portion of the other arm; and
said male member comprising a uniform thickness and a width which is at least equal to other portions of said one arm, and said female member is a slot through which said male member is movably retained.

5,065,517

CIRCLE CUTTER

Robby M. Markes, 2344 Bountiful Way, Shingle Springs, Calif. 95682

Filed Dec. 11, 1989, Ser. No. 448,554
Int. Cl.[5] B26B *3/08*
U.S. Cl. 30—300 **9 Claims**



1. A circle cutting hand tool comprising, in combination:

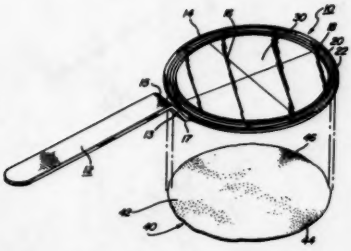
a. an elongate body having a pivoting end and an arc-traveling end;
b. an awl, perpendicular to said body at its pivoting end;
c. a crank handle, parallel to said awl and perpendicular to said body at said body's arc-traveling end;
d. a channel along a substantial length of said body, said channel having a series of regularly-spaced depressions along a wall thereof; and,
e. cutting means disposed in a channel between said body's ends, said cutting means having a detent ball projecting therefrom for engaging said depressions in said wall of said channel.

5,065,518

FOOD PRODUCT MEASURING DEVICE

Michael L. Herrera, 676 Albona, Pomona, Calif. 91768

Filed Aug. 21, 1990, Ser. No. 570,334
Int. Cl.[5] G01B *3/14*
U.S. Cl. 33—1 BB **2 Claims**



1. An apparatus for visually determining whether a tortilla is properly sized, comprising:
a planar disc member, at least an annular portion of the planar member being transparent;
means for delineating a minimum tortilla size line and a maximum tortilla size line on the transparent annular portion, the minimum tortilla size line and the maximum tortilla size line corresponding to a predetermined range of acceptable tortilla size;
handle means for supporting said planar disc member over said tortilla whereby a user may visually determine whether or not the tortilla is within the predetermined range of acceptable tortilla size by visually confirming that the outer edge of the tortilla is visible between the minimum tortilla size line and the maximum tortilla size line of the transparent annular portion;
a central portion of the planar disc member radially inward of the minimum tortilla size line being translucent whereby a central portion of the tortilla is visible and a user may inspect the surface of the tortilla therethrough; and
indicia that divide the central portion of the planar disc member into a plurality of sectors.

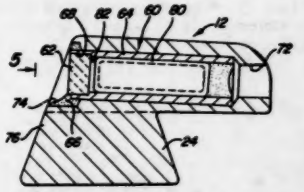
5,065,519

IRON SIGHT WITH ILLUMINATED PATTERN

Glyn A. J. Bindon, Farmington Hills, Mich., assignor to Trijicon, Inc., Farmington Hills, Mich.

Filed May 23, 1990, Ser. No. 527,271
Int. Cl.[5] F41G *1/32*
U.S. Cl. 33—241 **15 Claims**

1. An iron sight for a hand weapon comprising:
a sight blade adaptable to be located on the weapon and having a first side adapted to be viewed by the operator in sighting the weapon,
a bore located in said sight blade at said first side,
a self luminous capsule located in said bore in said sight blade for providing night sighting and having a generally circular light transmitting end, a counterbore located concentrically with said bore at said first side and defining with said capsule a ring having
generally precise inside and outside diameters surrounding



said capsule and said light transmitting end and defining a predetermined radial width, a substantially white material located within and generally filling said ring to define a white ring to provide improved day sighting.

5,065,520

RETICULE DEVICE FOR A FIRE SIGHTING SCOPE

Fumio Shimizu, Minamiminowamura; Yasutoshi Nishikubo, Shiojiri, and Tadaharu Naito, Suwa, all of Japan, assignors to Kabushiki Kaisha Light Kohki Seisakusho, Suwa, Japan

Filed Jun. 28, 1990, Ser. No. 545,924
Claims priority, application Japan, Jul. 31, 1989, 1-089246[U]
Int. Cl.[5] F41G *1/32*
U.S. Cl. 33—241 **8 Claims**

1. A reticle device for sighting scope, comprising
a scale,
a light source mounted in a vicinity of a peripheral edge of said scale, and
a reflection frame formed in the shape of a ring and mounted with respect to said scale and light source such that light emanating from said light source illuminates a side of said scale facing an eyepiece by reflecting off a surface of said reflection frame,
wherein said scale, light source, and reflection frame are mounted with respect to one another such that light emanating from said light source illuminates the side of said scale facing the eyepiece both directly and by reflecting off the frame surface.

5,065,521

MAGNETIC FIELD MEASUREMENT AND COMPASS CALIBRATION IN AREAS OF MAGNETIC DISTURBANCE

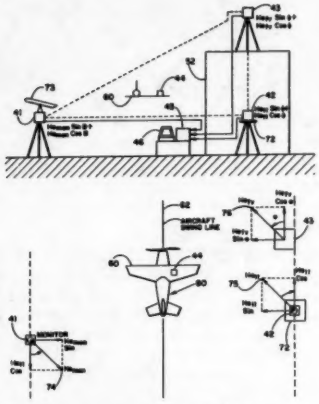
John L. Waldrop, and Clarence B. Glover, both of Albuquerque, N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 1, 1990, Ser. No. 561,151
Int. Cl.[5] G01C *17/38*
U.S. Cl. 33—361 **10 Claims**

1. A flux valve based magnetic field measurement and compass calibration apparatus, wherein the flux valve includes a current servo interface, an x axis, a y axis, an A leg, a B leg, and a C leg, each leg having a coil, and a flux valve location, comprising:
(a) a monitor flux valve having a means for axial alignment,

an x axis, a y axis, a primary monitor flux valve location and a first means for connecting to compensation and measurement equipment;

(b) a means for rotating a flux valve having a means for affixing a flux valve wherein the means for affixing a flux valve has a second means for connecting to compensation and measurement equipment and a means for rotating a flux valve location;



(c) a calibration computer having a display and plurality of means for connecting to a flux valve wherein the first said means for connecting to a flux valve is connected to the first means for connecting to compensation and measurement equipment and the second means for connecting to a flux valve is connected to the second means for connecting to compensation and measurement equipment; and

(d) an optical transfer adapter means for attachment to any of the flux valves.

5,065,522

METHOD OF DETECTING VERTICALITY, DETECTOR THEREFOR AND LEVEL MAINTAINING BASE WHICH EMPLOYS SAID DETECTOR AND WHICH ACTS TO MOUNT MECHANISM OR APPARATUS

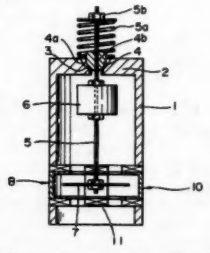
Kenro Motoda, and Hirosuke Isoe, both of Tokyo, Japan, assignors to Motoda Electronics, Co. Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 593,967

Claims priority, application Japan, Oct. 17, 1989, 1-268172; Jul. 20, 1990, 2-190428

Int. Cl.[5] G01C *9/14*

U.S. Cl. 33.1—366 **19 Claims**



1. A method of detecting verticality comprising the steps of:

hanging a weight from a reference member disposed along a vertical axis in a state where said weight can be freely swung forwards and rearwards and right and left;

detecting, in the direction of swinging of said weight, the state where said weight is swung when said weight is freely swung, said state being detected by proper detection means such as electric, magnetic or optical detection means;

analyzing a detection signal denoting the detected direction of the swing, whereby the inclination of said reference member with respect to the vertical axis is detected; and

positioning a spring between said weight and said reference member so that friction therebetween may be reduced when said weight swings freely.

5,065,523

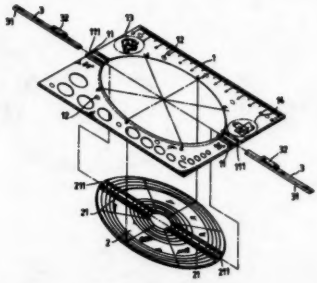
STRUCTURE OF ISOMETRIC ELLIPSE SCALE

Chieh-Tseng Chiang, No. 4, Alley 1, Lane 323, Sec. 3, I Chen Rd., Tang San Hsien, I Lan Hsien, Taiwan

Filed Jan. 7, 1991, Ser. No. 637,677

Int. Cl.[5] B43L *13/20, 11/055;* G09B *11/04*

U.S. Cl. 33—562 **3 Claims**



1. An isometric ellipse scale, comprising:

a body having an elliptical opening at the center, two pairs of parallel rails on the top edge thereof at two opposite ends, said two pairs of parallel rails each defining therein a dovetailed sliding way, a plurality of ellipse molding holes of different size on the top surface thereof at one side relative to said elliptical opening, a linear scale on the to surface thereof at an opposite side relative to said elliptical opening, and a plurality of raised portions symmetrically disposed at the bottom thereof;

a plurality of isometric ellipse molding plates that set one inside another with the topmost edge fitting flush with one another, each having an ellipse molding hole for drawing an ellipse and each being marked with markings for indicating the related diameter and major axis or minor axis, said isometric ellipse molding plates being releasably fastened in said body at said elliptical opening;

two fastening slides having each a dovetailed cross section suiting the size of said dovetailed sliding way, and movably fastened in said two pairs of parallel rails to secure said isometric ellipse molding plates in said elliptical opening of said body; and

a casing for keeping said body, said fastening slides and said isometric ellipse molding plates.

5,065,524

DEVICE FOR MEASURING THE INTERNAL DIAMETER OF TUBES

Andreas Langowski, Schramberg; Wolfgang Schultz, Tennenbronn, and Gerhard Walter, Alpirsbach, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 551,761

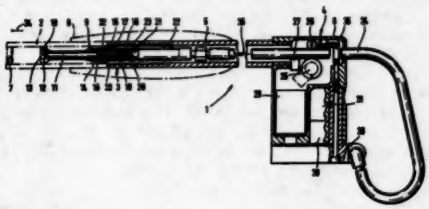
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922937

Int. Cl.[5] G01B *5/12*

U.S. Cl. 33—544.2 **8 Claims**

1. A device for measuring the internal diameter of a tube, comprising:

a measuring head with radially acting calipers;
a rod in said measuring head an in contact with said radially acting calipers, said rod moving axially in proportion to radial movement of said radially acting calipers;
spring tension means, connected to said measuring head for biasing said rod into contact with said calipers and urging said calipers radially outwardly;



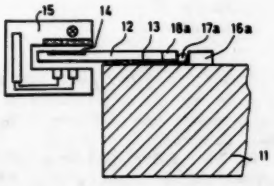
a tubular housing defining a measuring head receiving space, and containing said measuring head in an axially moveable manner in said measuring head space;
a shaft connected to said measuring head for moving said measuring head axially in said tubular housing and in the tube to be measured; and
measuring means for measuring movement of said shaft and said rod.

5,065,525

LENGTH OR ANGLE MEASURING DEVICE

Franz Szenger, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Sep. 4, 1990, Ser. No. 577,431
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929629
Int. Cl.[5] G01B *11/04*
U.S. Cl. 33—702 15 Claims



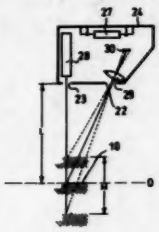
1. A length or angle-measuring device having a graduated-scale support which is mounted to a guide part which has a coefficient of thermal expansion that differs from that of the scale support, characterized by the fact that the scale support (12; 22; 32; 42; 62) consists of a material having a precisely known coefficient of thermal expansion, said scale support (i) having at least one surface drawn by the capillary action of a liquid film (13; 23; 33; 43; 63) toward a corresponding surface of the guide part (11; 21; 31; 41; 61), and (ii) has distributed-area support on said liquid film, and means securing the scale support against rotational or other bodily displacement on the liquid film.

5,065,526

PROBING DEVICE FOR A COORDINATE MEASURING APPARATUS

Karl-Hermann Breyer, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Division of Ser. No. 431,570, Nov. 3, 1989, Pat. No. 5,014,444.
This application Mar. 18, 1991, Ser. No. 670,865
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 8813875[U]
Int. Cl.[5] G01B *21/04*
U.S. Cl. 33—702 2 Claims



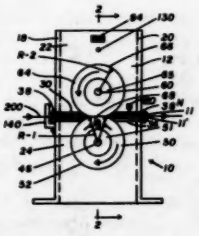
1. A contactless probing device for coordinate measuring apparatus, the probing device comprising:
a housing made of a given material;
interface means formed on said housing for exchangeably mounting the probing device on said coordinate measuring apparatus;
a temperature sensor having connecting terminals and being mounted in said housing so as to be in thermal contact with said material thereof;
contacts connected to said connecting terminals of said temperature sensor and mounted on said interface means for transmitting electrical signal data from said temperature sensor to said measuring apparatus; and,
optical sensing means mounted in said housing for making contactless measurements on an object or a workpiece.

5,065,527

LENGTH MEASURING AND POSITIVE DRIVE APPARATUS

Howard C. Shaw, 700 Wyndwicke Rd., St. Joseph, Mich. 49085

Filed Mar. 15, 1990, Ser. No. 669,984
Int. Cl.[5] G01B *3/12, 5/04*
U.S. Cl. 33—734 20 Claims



1. A mechanism for measuring a length of a continuously produced product comprising:
a housing having a first wall and a second wall;
a first shaft retained by said first and second walls;
a first rotatable member fixed to said first shaft, said first rotatable member having a first circumferential face, said first circumferential face having a pliable surface and a first fixed length;
a second shaft retained by said first and second walls;

a second rotatable member fixed to said second shaft, said second rotatable member having a second circumferential face, said second circumferential face having a pliable surface and a second fixed length;

means for establishing a fixed distance between said first and second shafts to bring said first and second circumferential faces into engagement to establish a common chord between said first and second rotatable members, said pliable surfaces on said first and second circumferential faces engaging and surrounding said product as the product moves along the entire length of said chord; and

means responsive to rotation of one of said first and second rotatable member to provide a linear readout of the movement of the product along said chord.

5,065,528

DRYING APPARATUS UTILIZING SOLAR HEAT

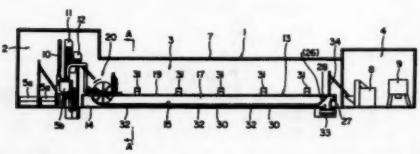
Aijiro Kaneko, and Masayuki Domon, both of Hanyu, Japan, assignors to Kaneko Agricultural Machinery Co., Ltd., Haryu, Japan

Filed Aug. 7, 1990, Ser. No. 563,383

Claims priority, application Japan, Aug. 8, 1989, 1-93297[U]

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—93 **4 Claims**



1. A solar-heat utilizing drying apparatus, comprising:

a drying room;

a solar heat transmitting/absorbing material surrounding said drying room;

an elongated drying cage which is disposed in said drying room having an opened upper side;

a horizontal ventilating panel disposed in said drying room dividing said drying room into an upper portion and a lower portion, said upper portion being formed into a drying portion and said lower portion being formed into an air-exhaust portion;

A self-propelled stirring/mixing transporter means movably mounted on said elongated drying cage to be movable in a vertical direction and in a longitudinal direction of said elongated drying cage, for stirring, mixing, and transporting matter having been received in said drying room from a supply side of said drying room to a discharge side of said drying room;

a plurality of air-exhaust ports formed in a side surface of said air-exhaust portion of said drying room at predetermined intervals; and

a plurality of air exhaust units respectively connecting said air exhaust ports.

5,065,529

APPARATUS FOR DRYING A WEB

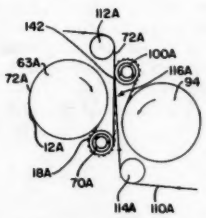
Borgeir Skaugen, and Gregory L. Wedel, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 167,672, Feb. 11, 1988, and a continuation-in-part of Ser. No. 201,705, Jun. 2, 1988, and a continuation-in-part of Ser. No. 230,627, Aug. 10, 1988, and a continuation-in-part of Ser. No. 235,394, Aug. 23, 1988, and a continuation-in-part of Ser. No. 243,742, Sep. 9, 1988, and a continuation-in-part of Ser. No. 244,774, Sep. 14, 1988, and a continuation-in-part of Ser. No. 417,978, Oct. 5, 1989, each is a division of Ser. No. 14,569, Feb. 13, 1987, and a continuation-in-part of Ser. No. 431,961, Nov. 3, 1989, which is a continuation-in-part of Ser. No. 429,730, Oct. 26, 1989, which is a continuation of Ser. No. 14,569,. This application Feb. 27, 1990, Ser. No. 485,681

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] F26B *11/02*

U.S. Cl. 34—117 **41 Claims**



35. A single tier drying section for drying a web comprising:

a dryer;

a felt guided about said dryer such that the web is disposed between said dryer and said felt for drying a first side of the web;

a further dryer disposed downstream relative to said dryer;

a further felt guided about said further dryer such that the web is disposed between said further dryer and said further felt for drying a second side of the web; and

dryer transfer means including:

a vacuum roll for guiding said further felt, said further felt and said felt defining a converging nip terminating on said vacuum roll such that the web is transferred without open draw from said felt to said further felt following said converging nip, said vacuum roll and said further felt, after said converging nip, forming in combination means for restraining the web against machine and cross-machine directional shrinkage.

5,065,530

CLOSURE DEVICE, PARTICULARLY FOR SKI BOOTS

Alessandro Pozzobon, Paderno di Ponzano Veneto, and Roberto Gorza, Feltre, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Nov. 16, 1989, Ser. No. 437,232

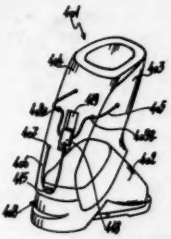
Claims priority, application Italy, Nov. 22, 1988, 82610 A/88

Int. Cl.[5] A43B *11/00, 5/04*

U.S. Cl. 36—50 **4 Claims**

1. Closure device, particularly for rear-entry ski boots comprising a shell and a front quarter and a rear quarter both connected to said shell, said shell defining a heel region, said closure device comprising a first traction element, a second traction element, and a slider element, said rear quarter being provided with a longitudinal seat in which said slider element is slidingly guided, said first traction element defining end portions and a middle portion between said end portions, said end portions of said first traction element being fixedly connected to opposite lateral sides of said front quarter, said middle portion of said first traction element being fixedly connected directly to said slider element, said second traction

element defining a first end and a second end, said first end of said second traction element being fixedly connected to said slider element, said second traction element extending directly



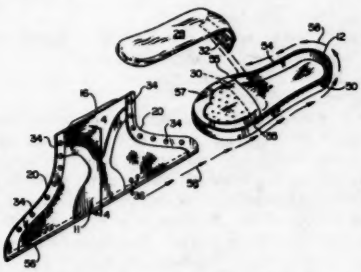
downwardly from said first end to said second end which is fixedly connected to said heel region of said shell, said closure device further comprising means for locking said slider element in a fixed position in said longitudinal seat.

5,065,531

ATTACHMENT DEVICE FOR PROVIDING DETACHABLE UPPERS IN FOOTWEAR AND THE LIKE

Patrick L. Prestridge, 5101 McLarnan Rd., Gambier, Ohio 43022

Filed Aug. 20, 1990, Ser. No. 569,988
Int. Cl.[5] A43B *3/24, 13/28*
U.S. Cl. 36—100 **22 Claims**



1. A shoe assembly comprising, in combination:

a lower shoe portion adapted to cover a lower portion of the foot of the wearer, said lower shoe portion including an elongated sole, a heel at one end of said sole and a curved toe at the opposite end thereof and having an elongated upper edge portion extending around said heel starting at a point located adjacent to said toe on one side of said lower shoe portion and ending at a point located adjacent to said toe on the opposite side of said lower shoe portion;

an upper shoe portion adapted to cover an upper portion of the wearer's foot, said upper shoe portion having an elongated lower edge portion the length of which is substantially equal to the length of said upper edge portion, said upper shoe portion being of a size and shape such that it defines an elongated opening extending substantially between said toe and said heel for receiving the foot of said wearer; and

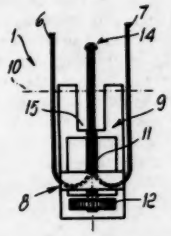
means for releasable connecting said lower edge portion to said upper edge portion so as to leave an open throat between said starting and ending points whereby said upper and lower shoe portions can be easily attached to and detached from one another during use of said shoe assembly.

5,065,532

CLOSURE DEVICE, PARTICULARLY FOR SKI BOOTS, ALLOWING GREATER WORKING LENGTH OF THE TIGHTENING CABLES

Roberto Gorza, Feltre, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jul. 23, 1990, Ser. No. 555,877
Claims priority, application Italy, Jul. 31, 1989, 59392/89[U]; Jul. 31, 1989, 59393/89[U]
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **7 Claims**



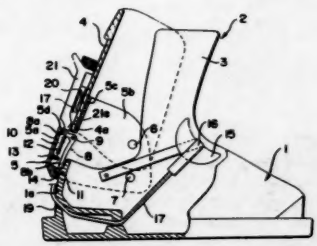
5. Closure device for a rear-entry ski boot which has a shell and a front quarter and a rear quarter both connected thereto, said rear quarter defining a longitudinal middle axis which is substantially a symmetrical axis of said rear quarter, said device comprising a lever means being pivoted to said rear quarter about a pivoting axis defined thereon, a guide member means being connected to said lever means, and at least one traction element means defining a first end, a second end, and a middle portion thereof, said first end of said traction element means being connected to a fixed point on said front quarter, said middle portion of said traction element means being guidingly engaged in said guide member means, and said second end of said traction element means being connected to a fixed point on said rear quarter which is positioned above said pivoting axis and substantially at said symmetrical axis thereof.

5,065,533

REAR ENTRY SKI BOOT

Jean Paris, Sevrier, France, assignor to Salomon S. A., Annecy Cedex, France

Filed Jan. 2, 1991, Ser. No. 636,729
Claims priority, application France, Jan. 18, 1990, 90 00565
Int. Cl.[5] A43B *5/04*
U.S. Cl. 36—117 **11 Claims**



1. Alpine ski boot of the rear entry type comprising a shell base 1 and an upper 2 journalled on the shell base, and an apparatus for tightening the foot of the skier located within the interior of the boot, said tightening apparatus comprising a movable foot tightening element within the shell base, a foot tightening lever positioned on the outside of the upper, at the rear of the same, and a flexible linkage element between the tightening lever and the movable tightening element in a manner so as to exert a traction on the flexible linkage element and

to press the movable tightening element on the foot of the skier when the foot tightening lever is pressed against the rear portion of the upper, in a tightening position, and wherein at least the rear portion is the upper of pivotably mounted around a first horizontal and transverse axis, on a stirrup surrounding the rear of the shell base and which is itself pivotably mounted on this shell base, around a second horizontal and transverse axis positioned at the lower level of that of the first journal axis of the upper on the stirrup, the stirrup carries, at its rear central portion, an element for latching the stirrup in the upper position for skiing, this element being biased by a return spring in the direction of the unlatching position in which it is distanced from the shell base, and being adapted to be activated by the foot tightening lever, when this lever is pressed against the rear of the upper in the foot tightening position, and to be pushed back, by the tightening lever, in the direction of the shell base on which it is then supported to ensure the latching of the stirrup in the upper position for skiing, the disengagement of the tightening lever automatically causing the movement of the latching element of the stirrup, under the effect of its return spring, into the unlatching position and ensuring the freeing of the stirrup.

5,065,534

STUDS FOR FOOTWEAR

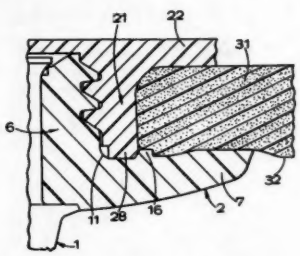
Roy S. Collins, Sutton Coldfield, England, assignor to Trisport Ltd., Tamworth, England

Continuation of Ser. No. 760,319, Jul. 29, 1985, abandoned. This application May 5, 1987, Ser. No. 51,267

Claims priority, application United Kingdom, Jul. 27, 1984, 8419182

Int. Cl.[5] A43B *5/00*; A43C *15/16*

U.S. Cl. 36—134 **17 Claims**



1. A stud for use with an article of footwear, said stud comprising a pin having a ground-engaging lower portion and an upper portion, and a one-piece molded plastic member surrounding the upper portion of said pin and lockingly engaging the same, said one-piece plastic member comprising an externally screw-threaded spigot and an outwardly extending flange at the lower end thereof, said flange having an upper surface extending outward to contact a footwear sole when the spigot is screwed into a socket in said sole, said upper surface having an annular well adapted to receive a lower end of a socket, an outer edge of said annular well being formed by a retaining means spaced outward from said pin and inboard from an outer edge of said upper surface of said flange to restrain spreading of the lower end of said socket due to contact with said retaining means.

5,065,535

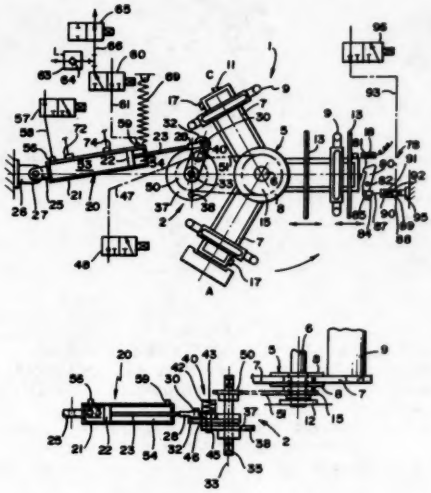
INDEXING SYSTEM FOR ROTARY GARMENT PRESS

Sarupinderpal S. Gill, and Manohar Mohan, both of Cincinnati, Ohio, assignors to American Laundry Machinery, Inc., Cincinnati, Ohio

Filed Jun. 29, 1990, Ser. No. 545,647

Int. Cl.[5] D06F *71/10*

U.S. Cl. 38—22 **16 Claims**



1. A garment press comprising:

a carriage having at least one radial arm for supporting a pressing buck and rotatably mounted for motion about a rotational axis extending generally perpendicular to said at least one radial arm;

indexing means for intermittently rotating the carriage in a single direction to sequentially align said at least one radial arm with at least one work station position, said indexing means including a linearly reciprocating actuator means and a motion transfer means between said actuator means and said carriage, said motion transfer means including a reciprocating to intermittent unidirectional rotary motion converter mechanism connected by a motion transmitting coupling to said carriage.

5,065,536

STRETCH FRAME FOR A STRETCH BED SHEET

Maria Krammer-Herbst, Rebaystrasse 18, 8870 Günzburg, Fed. Rep. of Germany

Filed Mar. 23, 1990, Ser. No. 498,032

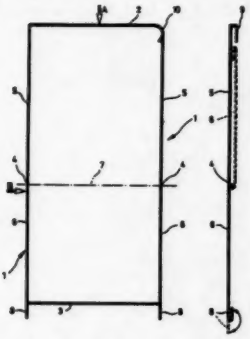
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1989, 3909934

Int. Cl.[5] D06C *5/00*

U.S. Cl. 38—102.91 **6 Claims**

1. A stretch frame for folding and storing a stretch bed sheet, wherein said sheet has a width and contoured elasticized ends and corners, and wherein said sheet is first folded in half forming two ends with a fold line at one end and said contoured corners at the other end, said frame comprising a pair of parallel legs, a shorter leg connecting the parallel legs at one end thereof, said shorter leg having a hairpin-like configuration, said shorter leg having a dimension corresponding to the width of the sheet when the elasticized ends thereof are stretched therearound and connected to the shorter leg, pivot joint

means in an intermediate location of each of the parallel legs for conjoint folding of said legs about an axis parallel to said



shorter leg, and clamping means at the other end of said parallel legs for detachably securing said bed sheet at said fold line.

5,065,537

CHANGEABLE LETTER SIGN SYSTEM

Raymond J. Bailey, Cortez, Fla., assignor to Americraft Corporation, Palmetto, Fla.

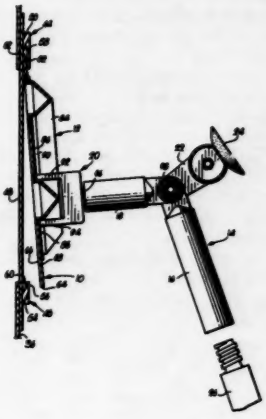
Filed Mar. 22, 1990, Ser. No. 497,358
Int. Cl.[5] G09F *7/02*; A47F *13/06*
U.S. Cl. 40—618 12 Claims

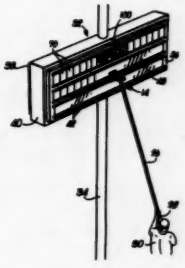
1. A changeable letter sign system comprising:

a readerboard for receiving a plurality of panels, each bearing a three dimensional, plastic letter thereon, said panels being combinable to collectively present a message displayed on the readerboard, said panels each having a normally front face and a normally rear face, the rear face being proximal to the readerboard when the panel is in place, the front face having the letter thereon and facing outwardly from said readerboard;

means for retaining said panels with respect to the readerboard; and

magnetically attractive material carried by each of said panels, the magnetically attractive material being only on





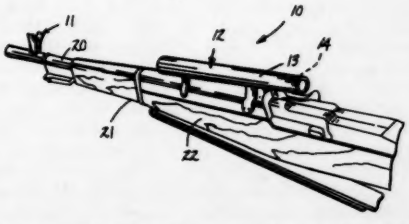
said front face providing a means for removing the panel from the readerboard.

5,065,538

NOCTURNAL RIFLE SIGHT ORGANIZATION

Rhandall A. Allen, 12604 Tollhouse Rd., Spotsylvania, Va. 22553

Filed May 24, 1990, Ser. No. 527,864
Int. Cl.[5] F41G *1/42*
U.S. Cl. 42—103 6 Claims



1. A nocturnal rifle sight apparatus for use with a rifle including an elongate coaxially aligned rifle barrel mounted within an elongate rifle stock, the apparatus including a front sight member fixedly mounted to the rifle barrel at a forward end thereof coaxially aligned with a rear sight member fixedly mounted overlying the rifle barrel, the forward sight member defining a "Y" shaped configuration, and

the rear sight member defining a cylindrical sight wherein the cylindrical sight defines a cylindrical sight axis bisecting the "Y" shaped configuration of the forward sight member, and

the "Y" shaped configuration including a central vertical post wherein the central vertical post includes a planar forward face, and

a left arcuate leg extending upwardly and laterally of the central vertical post, and

a right arcuate leg extending upwardly and laterally of the central vertical post wherein the right and left arcuate legs each define confronting convex surfaces, and

wherein the central vertical post includes a central blade integrally and orthogonally mounted to a top surface of the central vertical post, the central blade including a blade top surface, and

including a plurality of aligned equally spaced luminescent elevational dots fixedly mounted to the planar forward face underlying and aligned with the central blade.

5,065,539

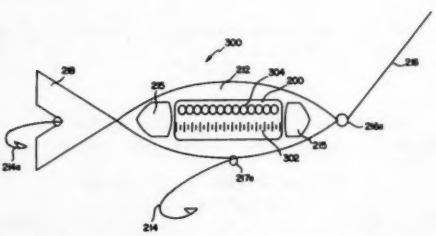
DEVICE FOR MEASURING SUBSURFACE TEMPERATURES OF LIQUID BODIES, USEFUL FOR DETERMINING OPTIMUM FISHING LOCATIONS

Bruce F. Monzyk, 2254 Murray Forest, Maryland Heights, Mo. 63043, and Lloyd A. Woodard, 7322 E. 107th St., Kansas City, Mo. 64134

Division of Ser. No. 46,782, May 7, 1987, Pat. No. 4,883,365. This application Nov. 17, 1989, Ser. No. 438,628

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—4 **13 Claims**



1. A method of determining the appropriate location and depth for fishing for a particular type or types of fish in a body of water containing a variety of temperatures comprising: lowering into the body of water a temperature sensing device with a support including a temperature sensing component imbedded a distance of at least about 0.06 inches within a thermally insulating and a non-wetting matrix to a first depth at a first location; allowing the temperature sensitive device to substantially thermally equilibrate to the temperature at this depth; quickly removing the temperature sensitive device from the water body by means of said support; comparing the temperature reading with the preferred temperature for fishing for that particular fish; again measuring the temperature at a depth either deeper or shallower or in a different location than the previous depth and location; again comparing the reading with the preferred temperature for the particular fish being sought; and repeating this process until the depth and location is found where the temperature corresponds to the preferred temperature for fishing for that particular fish.

5,065,540

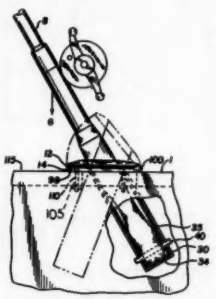
STRIKING ROD HOLDER

William S. Potter, Jr., 4235 Douglas Rd., Coconut Grove, Fla. 33133

Filed Oct. 31, 1990, Ser. No. 606,114

Int. Cl.[5] A01K *97/10*

U.S. Cl. 43—21.2 **32 Claims**



1. A striking rod holder comprising:

a first member;

a rod holding tube attached to said first member; and

a second member for attaching to a surface, at least one of said first member and said second member having a passageway through which said rod holding tube passes, and said first member pivotally attached to said second member.

23. A striking rod holder adaptor for converting a flush-mounted fixed striking rod holder having a mounting plate and a rod holding tube attached thereto into a tilting rod holder comprising:

a first member for attaching to the flush-mounted fixed striking rod holder; and

a second member for attaching to a surface, at least one of said fist member and said second member having a passageway through which said rod holding tube passes, and said first member pivotally attached to said second member.

5,065,541

ARTIFICAL FISHING LURES

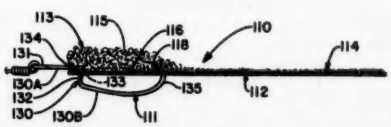
Archibald S. Coody, Hemphill, Tex., assignor to Fred Arbogast Company, Inc., Akron, Ohio

Continuation-in-part of Ser. No. 470,850, Jan. 26, 1990, Pat. No. 5,007,194. This application Sep. 21, 1990, Ser. No. 586,577

The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.29 **2 Claims**



1. An artificial fishing lure in combination with a fish hook having an eye, a shank portion and a point, said fishing lure comprising:

a body having a head portion with at least one surface and a leading edge;

said body being natural sheepskin which presents at least one planar surface and also having a long, narrow portion extending rearwardly from said head portion;

a plurality of relatively long fibers which are natural wool fibers presented from the planar surface of said sheepskin

extending outwardly from at least one surface of said head portion;

means to interconnect said head portion to the shank of the hook in proximity to the eye thereof;

the point of the hook also penetrating said head portion to be received among said relative long fibers.

5,065,542

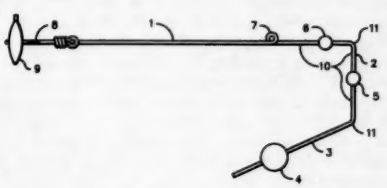
MULTI-WEIGHTED SPRING DRIVEN LURE ATTACHMENT

Harold L. Lindaberry, P.O. Box 241, Mansfield, Pa. 16933

Filed Oct. 5, 1990, Ser. No. 593,793

Int. Cl.[5] A01K *91/00*

U.S. Cl. 43—42.74 **7 Claims**



1. A multi-weighted spring driven lure attachment device consisting of a resilient member bent into three sections and weights mounted thereon, said resilient member including a first section having a lure and hook bearing arm member with lure attachment means; a second section bent substantially perpendicular to said first section; a third section bent from said second section; wherein a first weight is attached to said third section and a second weight is attached to the first section or the second section, and the first weight is as heavy or heavier than the second weight.

5,065,543

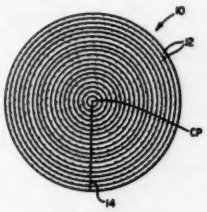
TREE GUARD MAT

Alan R. Brook, 7206 Hidden Hills North, San Antonio (Bexar County), Tex. 78244

Continuation-in-part of Ser. No. 320,981, Nov. 17, 1990, abandoned. This application Jun. 4, 1990, Ser. No. 532,554

Int. Cl.[5] A01G *17/00*

U.S. Cl. 47—25 **5 Claims**



1. A tree guard mat for suppressing plant growth around the base of a tree and thereby protecting the tree from damage caused by line trimmers, comprising:

(a) a plurality of flexible ropes of successively longer lengths arranged concentrically into a mat;

(b) each rope being removably bound into the mat; and

(c) each rope being joined at a separation line extending from the innermost to the outermost rope;

(d) such that the mat may be adjusted for installation by removing a selected number of inner rings to form a central hole corresponding in diameter to the diameter of the tree trunk at ground level;

(e) whereby the tree guard mat may be installed by separating the remaining ropes along the separation line, inserting the mat around the tree trunk through a gap formed by that separation, and then rejoining the rings to form a substantially continuous mat around the tree.

5,065,544

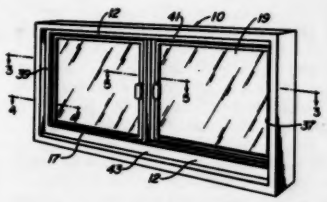
WINDOW ASSEMBLY

Norman D. Martin, San Dimas, Calif., assignor to Thomas B. Nuckolls and Stanley D. Daubenbis, both of Covina, Calif., part interest to each

Filed Oct. 10, 1990, Ser. No. 595,029

Int. Cl.[5] E05D *15/22*

U.S. Cl. 49—177 **1 Claim**



1. A window assembly comprising:

a stationary frame means including two upstanding side members, and upper and lower track means connecting said side members, each track means comprising an exterior track and an interior track offset from each other,

an upstanding exterior window unit having upper and lower edge portions thereof extending into the exterior tracks, whereby said exterior window unit is slidably movable across the space between the upstanding side members,

an upstanding interior window unit having upper and lower edge portions thereof extending into the interior tracks, whereby said interior unit is slidably movable across the space between the upstanding side members,

each window unit comprising a rectangular frame having an upper rail, a lower rail, and two side rails, the two side rails defining the horizontal width dimension of the respective window unit,

each window unit having a width dimension slightly greater than one-half the spacing between the stationary side members so that when the window units are in their fully closed positions two side rails thereof are in overlapping relation and the other two side rails are positioned against respective ones of the stationary side members,

the said four rails of each movable window unit having flanges extending in a common plane within the profile plane of the window unit rectangular frame,

resilient elastomeric sealing strips on the interior face of each flange to provide a substantially annular seal means,

window pane means disposed within each rectangular frame and having a closed position wherein its exterior face engages the associated annular seal means to prevent passage of rain water through the joint between the window pane means and the associated frame, and

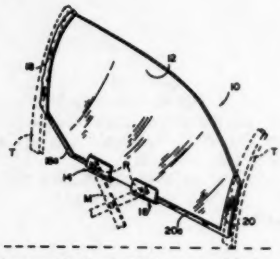
hinge means having vertical axes and connecting each window pane means to one of said other two side rails of the associated rectangular frame, whereby each window pane means is swingable in a horizontal arc into a room interior space when the window units are in their fully closed positions.

5,065,545

PANEL ASSEMBLY FOR VEHICLES WITH MOLDED REGULATOR ATTACHMENT

Edmund J. Kane, Holland, and Roger L. Koops, Hamilton, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Mar. 19, 1991, Ser. No. 671,373
Int. Cl.[5] E05F *11/38*
U.S. Cl. 49—375 53 Claims



1. A panel assembly for vehicles comprising:

a sheet of material having side surfaces and a peripheral edge;

at least one attachment member for connecting said sheet to a support such as a window regulator mechanism, said attachment member being molded on said peripheral edge of said sheet from a moldable, resinous material such that said member is securely adhered to said sheet during molding, said attachment member having securing flanges extending along both side surfaces of said sheet and encapsulating said peripheral edge, and an elongated slot extending along the length of said member for receiving a portion of the window regulator mechanism; and access means for inserting a portion of the window regulator mechanism in said slot;

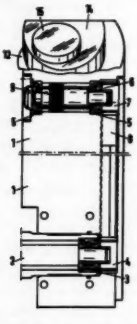
whereby a portion of the regulator mechanism may be supported on said attachment member for movement in said slot to move said panel assembly between desired positions.

5,065,546

GRINDING WHEEL FOR PRODUCING INTERNAL PROFILINGS

Manfred Lorenz, Coburg, Fed. Rep. of Germany, assignor to Kapp GmbH, Coburg, Fed. Rep. of Germany

Filed May 4, 1990, Ser. No. 518,912
Claims priority, application European Pat. Off., Sep. 7, 1989, 89116534.2
Int. Cl.[5] B24B *5/00*
U.S. Cl. 51—134.5 R 4 Claims



1. In a grinding wheel for producing internal profilings, and including a grinding disk that is disposed at a front end of a rod-like grinding machine arm at the respective angle of slope of the internal profiling that is to be produced, with said grinding disk being adapted to be driven by a drive shaft, which is disposed at the other end of said arm, via drive means that extends through said arm, the improvement wherein said drive means comprises:

a first belt pulley connected to said drive shaft;

an intermediate shaft disposed in said front end of said arm;

a second belt pulley connected to said intermediate shaft;

a belt disposed within said arm and interconnecting said first and second belt pulleys and hence said drive shaft and said intermediate shaft;

a spindle on which said grinding disk is mounted;

a first gear wheel disposed on said intermediate shaft;

a second gear wheel disposed on said spindle, with said first and second gear wheels forming an intermeshing pair of gear wheels that provides a driving connection between said intermediate shaft and said spindle; and

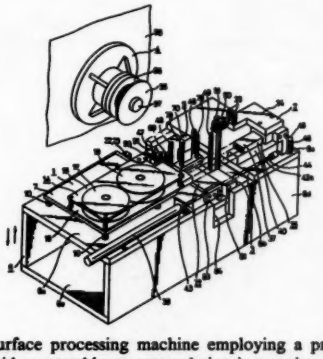
bearing means for disposing said spindle on said arm so that said spindle is pivotable about a center point of said first gear wheel on said intermediate shaft, said grinding disk provided with an uncorrected profile that can be adapted to the respective angle of slope of internal profiling that is to be produced without disassembling the grinding wheel such that the grinding disk can be driven at high speeds with little energy loss.

5,065,547

SURFACE PROCESSING MACHINE FOR HARD DISKS AND THE LIKE

Tatsuo Shimizu, Sendai; Kazunori Ozawa, Tomiya; Kenji Yazawa, Shiogama, and Kazunori Tani, Machida, all of Japan, assignors to Speedfam Company, Ltd., Japan

Filed Jun. 6, 1989, Ser. No. 362,209
Claims priority, application Japan, Jun. 6, 1988, 63-138610
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] B24B *21/02*
U.S. Cl. 51—154 25 Claims



1. A surface processing machine employing a processing tape cartridge rotatably accommodating in a casing a pair of reels carrying a winding of processing tape, said surface processing machine comprising:

a cartridge holder for holding said processing tape cartridge fixedly in position on said machine;

a tape drawing mechanism adapted to draw out part of said processing tape in said cartridge to a predetermined position;

a guide roller mechanism for setting and transporting said processing tape in a predetermined path of travel through a machining position;

a work holder mechanism adapted to hold and rotate a work thereon at said machining position;

a tape pressing mechanism for pressing said processing tape against said work;

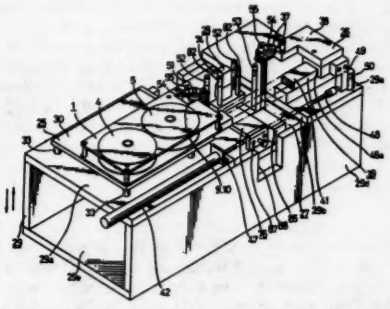
said cartridge holder and tape drawing mechanism being mounted on a main surface of a housing, said guide roller mechanism and said tape pressing mechanism being supported in movable relation within an opening provided in a center portion of said housing, and said work holder being adapted to hold said work opposingly to said machining position, in a center portion on said main surface of the housing; wherein said cartridge holder comprises a cartridge mount plate in level relation with the path of tape travel, positioning pins rigidly located on said housing for securely holding said cartridge thereon, and a pair of hub drive shafts projected through said cartridge mount plate for engagement with hub portions of said tape reels carried by said tape cartridge, said tape cartridge being provided with positioning holes to be fitted on said positioning pins in said cartridge holder.

5,065,548

SURFACE TREATING TAPE CARTRIDGE AND SURFACE TREATING MACHINE

Tatsuo Shimizu, Sendai; Kazunori Ozawa, Tomiya; Kenji Yazawa, Shiogama, and Kazunori Tani, Machida, all of Japan, assignors to Speedfam Company, Ltd., Japan

Filed Jun. 6, 1989, Ser. No. 362,211
Claims priority, application Japan, Jun. 6, 1988, 63-138611
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] B24B *21/02*
U.S. Cl. 51—154 **17 Claims**



1. A surface treating machine employing a surface treating tape cartridge, said machine comprising:

a surface treating tape cartridge having a casing composed of separably joined upper and lower halves, and a pair of reels carrying a winding of surface treating tape and rotatably accommodated between said upper and lower halves of said casing;

a cartridge holder for holding said surface treating tape cartridge fixedly in position on said machine;

a tape drawing mechanism adapted to draw out part of said surface treating tape in said cartridge to a predetermined position;

a guide roller mechanism for setting and transporting said surface treating tape in a predetermined path of travel through a work treating position;

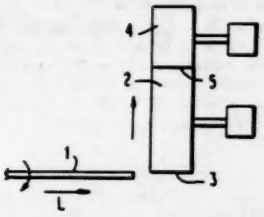
a tape pressing mechanism for pressing said surface treating tape against a work at said treating position, said tape pressing mechanism comprising a tape pressing member for pressing said surface treating tape against the surface of said work, a base plate mounting said tape pressing member thereon, and a slider portion for sliding said base plate toward and away from said treating position, wherein said tape pressing member is provided with a pressing portion having a pair of guide pins mounted on the forward end portion thereof for pressing said surface treating tape uniformly against the surface of said work, and a base portion fixedly mounted on said base plate, wherein the pressing portion is provided with air holes, and means to blow air blasts against said surface treating tape in said treating position through said air holes in a direction perpendicular to the tape face.

5,065,549

METHOD AND APPARATUS FOR MANUFACTURING K-FILES AND REAMERS

Robert D. Speiser, New York, N.Y.; Steven Bernstein, York, Pa.; Charles N. Miller, Spring Grove, Pa., and Dane Shearer, York, Pa., assignors to Union Broach, York, Pa.

Continuation of Ser. No. 363,691, Jun. 9, 1989, Pat. No. 4,999,952. This application Dec. 10, 1990, Ser. No. 624,865
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] B24B *3/00, 5/00*
U.S. Cl. 51—288 **10 Claims**



1. A process of producing a dental instrument having a plurality of flutes each with a predetermined number of spirals over a predetermined length of the instrument, and having a predetermined taper, the method comprising the steps of:

providing a single grinding wheel having a plurality of grinding ribs extending from a periphery thereof;

rotating said grinding wheel about a first axis;

feeding, along a second axis, a rotating bar stock past the plurality of grinding ribs so as to grind said bar stock; and

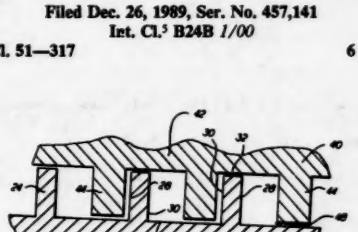
simultaneously with said feeding step translating one of said grinding wheel and said bar stock such that a distance between the first and second axes increases as said bar stock is fed, and such that a single pass of said bar stock by the plurality of grinding ribs of said single grinding wheel produces the multi-fluted tapered dental instrument.

5,065,550

LAPPING OF INVOLUTE SPIRAL SCROLL ELEMENT

Shahrokh Etemad, Stratford, Conn., and Howard H. Fraser, Jr., Lafayette, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 26, 1989, Ser. No. 457,141
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—317 **6 Claims**



1. A method of finishing a scroll element for a scroll rotary machine in which the scroll element has a base with a radially flat surface and a generally spiral wrap about an axis of the element with side walls that are axially erect comprising the steps of:

placing against said scroll element a lapping device that has

a radially extending base and a generally spiral wrap about an axis of the lapping device, the generally spiral wrap matching the wrap of the scroll element, but wherein said lapping element wrap is significantly and uniformly thicker radially than the scroll element wrap, the wrap of the lapping device having axially erect walls and a radially flat tip surface that faces against the base flat surface of the scroll element; said scroll element wrap and lapping device wrap defining a series of crescent shaped volumes that diminish in size from an outer edge to the axis of the scroll element and lapping device;

moving the scroll element and the lapping device against one another in an orbiting motion in which the axes of the device and scroll element revolve about one another but the device and scroll element maintain a constant azimuthal orientation relative to one another; and

flowing a suitable lapping compound at least between the tip surface of the lapping device and the base surface of the scroll element and between the lapping device wrap and the side walls of the scroll element wrap while the lapping device and scroll element are being moved in said orbiting motion in contact with one another, by introducing said lapping compound directly into said crescent shaped volumes and distributing the compound by orbiting action of the scroll element and the lapping device, for lapping at least the base flat surface and side walls of the scroll element.

5,065,551

ABRASIVE CLEANING OR CUTTING

George M. Fraser, Barton-on-Humber, Great Britain, assignor to Cleaning Technology Limited, Scunthorpe, England

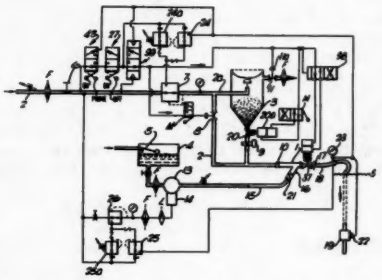
PCT No. PCT/GB89/00201, § 371 Date Aug. 10, 1990, § 102(e) Date Aug. 10, 1990, PCT Pub. No. WO89/08007, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 28, 1989, Ser. No. 555,432

Claims priority, application United Kingdom, Mar. 2, 1988, 8804970; Nov. 25, 1988, 8827582; Nov. 25, 1988, 8827583

Int. Cl.[5] B24C *3/00*

U.S. Cl. 51—410 **16 Claims**



1. Apparatus for underwater abrasive cleaning and/or cutting, comprising:

a mixing zone for preparing an abrasive mixture comprising abrasive particles, air and a liquid;

means for controlledly supplying the abrasive particles, air under pressure, and liquid to the mixing zone in such a way that a resultant abrasive stream includes abrasive particles substantially surface-wetted by the liquid and entrained in air or an air/liquid mist as an abrasive carrier;

an outlet nozzle for directing the abrasive stream at an underwater surface to be cleaned and/or cut;

a pipeline connecting the mixing zone to the outlet nozzle for conveying the abrasive stream to the nozzle; and

means for adjusting the flow rates of the abrasive particles, air and liquid and the mixing zone pressure, relative to each other, depending one the working depth of the nozzle underwater, so as to discharge an abrasive stream of composition as set forth above through the nozzle at a pressure less than about 100 psig (7 kg/cm^2) above the ambient hydrostatic pressure at the nozzle.

5,065,552

ACTIVE SEISMIC RESPONSE CONTROL SYSTEM FOR USE IN STRUCTURE

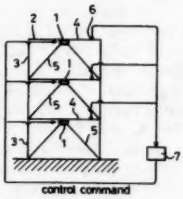
Takuji Kobori; Motoichi Takahashi; Tadashi Nasu; Naoki Niwa; Narito Kurata; Junichi Hirai, and Yoshinori Adachi, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 475,367

Claims priority, application Japan, Feb. 7, 1989, 1-27901; Feb. 7, 1989, 1-27905; Feb. 23, 1989, 1-43565; Mar. 14, 1989, 1-61237

Int. Cl.[5] E04H *9/00*

U.S. Cl. 52—1 **15 Claims**



1. For use with a building structure having frame means of vertical post means, horizontal beam means and variable stiffness means to brace such frame means, a continuously variable active seismic and wind response control system comprising: double acting hydraulic damper means including a piston cylinder; a piston shiftably mounted within said piston cylinder and positioned to define a cylinder chamber on opposite sides of said piston; piston rod means connected to said pistons and having opposite ends adapted to pass axially through said cylinder chambers; means to pass hydraulic fluid between said cylinder chambers responsive to a shifting of said piston axially within said cylinder; valve means to control the rate and volume of flow of said hydraulic fluid between said cylinder chambers; means to secure said piston rod means between said frame means and said variable stiffness means adapted to damp vibrations therebetween; solenoid means adapted to open and close said valve means; a pulse generator adapted to actuate said solenoid means by pulse signals; sensor means located on said building structure adapted to sense and to signal building structure vibrations; computer program means; and computer means programmed by said computer program means to receive signals from said sensor means to analyze said signals and to signal said pulse generator means to actuate said solenoid means responsive to said computer means analysis of said sensor signals, whereby said active seismic and wind control system provides a continuously variable means to dampen seismic and wing vibrations received by a building structure.

5,065,553

ROOF FLASHING UNIT

Sanford J. Magid, 3 Blind Brook Ter., Rye Brook, N.Y. 10573

Filed May 11, 1990, Ser. No. 522,094

Int. Cl.[5] E04B *7/00*; E04D *1/28*

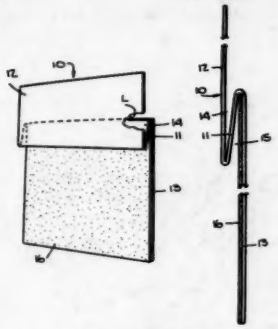
U.S. Cl. 52—58 **11 Claims**

1. A flashing unit for installation on an upstanding wall at its intersection with a roof, said unit comprising:

(a) a rectangular metal flashing sheet having a transverse bend therein dividing the sheet into an upper counter section attachable to the wall and a large base section that extends to the roof, said bend having a Z-formation whose diagonal defines with the counter section an open-ended channel and the base section an open-ended pocket; and

(b) a flexible, waterproofing rectangular membrane whose upper edge is received in said pocket, the membrane overlying the base section and having a length that extends

substantially to the roof, whereby said membrane is substantially coextensive with said base section, said flashing unit being one unit in an overlapping series of like units, the fold line between the diagonal and the base section at the end of said one unit in the series being slit to permit



telescoping of the channel of the adjacent unit in the channel of the one unit, the base section of the adjacent unit overlapping that of the one unit and the membrane of the adjacent unit overlapping that of the one unit whereby the membranes are shingled.

5,065,554

SHELL STRUCTURE

Pertti Neva, Näsilinnankatu 28 E, SF-33200 Tampere, and Ralf Lindberg, Timpurinkatu 17, SF-33720 Tampere, both of Finland

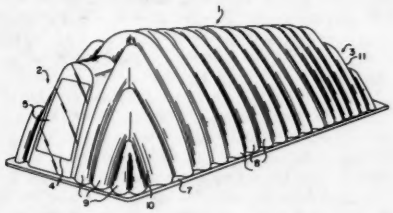
PCT No. PCT/FI88/00179, § 371 Date May 4, 1990, § 102(e) Date May 4, 1990, PCT Pub. No. WO89/04404, PCT Pub. Date May 18, 1989

PCT Filed Nov. 4, 1988, Ser. No. 488,014

Claims priority, application Finland, Nov. 5, 1987, 874886

Int. Cl.[5] E04B *7/00*

U.S. Cl. 52—82 **12 Claims**



1. A shell structure comprising:

a single body of reinforced plastic defining a hollow, open bottom housing member, said housing member including an elongate portion having a substantially parabolic cross-sectional shape and two gables closing said elongate portion at the opposite ends thereof, said gables being inclined towards the central plane of the housing member, and a flange-shaped reinforcement portion extending along the edge of said open bottom of said housing member;

said elongate member and said two gables being corrugated such that its corrugations extend substantially perpendicularly to the edge of said open bottom and wherein said corrugations of said elongate portion and said inclined gable extend in the same phase at junctures between said elongate portion and said gables.

5,065,555

ELASTO-PLASTIC DAMPER

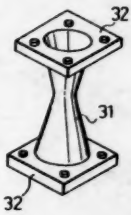
Takuji Kobori; Shunichi Yamada; Shigeru Ban; Koji Ishii; Isao Nishimura; Masatoshi Ishida; Kuniaki Sato; Yasuo Takenaka; Shozo Maeda, and Jun Tagami, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, Japan

Division of Ser. No. 140,307, Dec. 31, 1987, Pat. No. 4,901,486. This application Nov. 21, 1989, Ser. No. 439,087

Claims priority, application Japan, Mar. 6, 1987, 62-51288; Mar. 6, 1987, 62-51289; Mar. 6, 1987, 261-51290; Jul. 31, 1987, 62-102360; Jul. 31, 1987, 62-192358; Jul. 31, 1987, 62-192359

Int. Cl.[5] E04B *1/98;* E04H *9/02*

U.S. Cl. 52—167 DF **11 Claims**



1. An elasto-plastic damper means adapted to protect building structures by attenuating seismic tremors comprising: a steel load-bearing damper body having a top and a base; said damper body being adapted to support and to space apart a first structure member from a second structure member; said top being adapted to be rigidly secured to said first structure member; said base being adapted to be rigidly secured to said second structure member; and said damper body being deformable responsive to seismic tremors of a magnitude sufficient to stress said damper within its elastic limit and being plastically deformable responsive to seismic tremors of a magnitude sufficient to stress said damper beyond its elastic limit; said damper body comprising a pair of frusta joined at their minor diameters.

5,065,556

SPACE DIVIDING PARTITION SYSTEM HAVING AN ELECTRICAL RACEWAY

Ronald B. DeLong, Belmont; Brian J. Persing, Grand Rapids; Charles G. Raabe, Leonard Heights; James R. Bouse, Belmont, all of Mich.; Peter F. Bemis, Sheboygan, Wis.; Hollerbach, Eric T., Gross Pointe Park, Mich.; Bradley J. Bruggink, Oostburg, and Daniel Cykana, Sheboygan, both of Wis., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 15, 1990, Ser. No. 523,776

Int. Cl.[5] E04F *19/06*

U.S. Cl. 52—221 **19 Claims**

3. A space dividing office system, including a partition having an electrical raceway below a bottom edge thereof, comprising:

an elongated extruded plastic spine having first and second ends, a centrally disposed vertical web having first and second sides, with said vertical web extending between the first and second ends, a bottom portion which includes a depending noise seal and first and second extruded grooves on opposite sides of said noise seal,

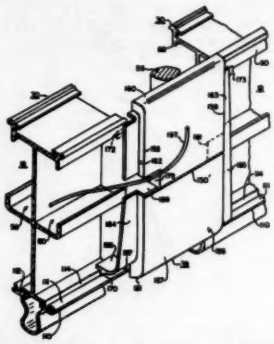
first and second extruded plastic side panels each having first and second ends, a longitudinal axis between the first and second ends, inner and outer surfaces, a top, and a bottom having a mounting edge,

the mounting edges of the first and second side panels being respectively telescoped into and frictionally engaged with the first and second extruded grooves of the spine,

and means for attaching the spine to the bottom edge of the partition,

said spine including a top portion having an upwardly open C-shaped slot,

said means for attaching the spine to the bottom edge of the partition including a mounting strip having a substantially hat-shaped cross-sectional configuration, and means fixing the mounting strip to the bottom edge of the space dividing partition, wherein the C-shaped upwardly facing slot of the spine is telescoped over the hat-shaped mounting strip,



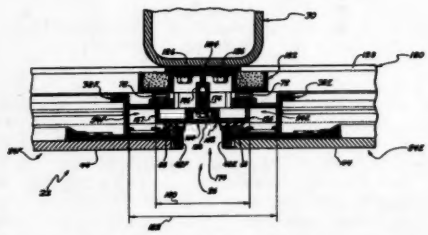
said mounting strip being an extruded plastic member which includes first and second laterally extending flanges over which the C-shaped upwardly facing slot is telescoped, with each of the first and second laterally extending flanges having at least one outwardly extending co-extruded friction pad formed of a softer plastic than the remaining portion of the mounting strip, with said co-extruded friction pads frictionally engaging the spine to resist disassembly of the spine from the mounting strip.

5,065,557

CURTAIN WALL SYSTEM WITH INDIVIDUALLY REMOVABLE WALL PANELS

Russell Laplante, Arnold; James A. Rockar, Grover, and Robert H. Stegeman, Jr., Old Monroe, all of Mo., assignors to Robertson-CECO Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1990, Ser. No. 607,526
Int. Cl.[5] E04B *2/88*
U.S. Cl. 52—235 **22 Claims**



1. A vertical joint between horizontally adjacent wall panels of a wall structure, comprising:

said panels having inner and outer panel faces, and presenting spaced-apart vertical edges with a vertical gap therebetween;

rail means secured to said inner panel faces at said vertical edges and presenting vertical recesses open at and extending inwardly from said vertical edges; and

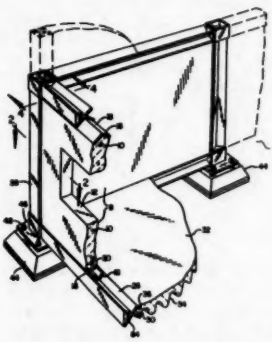
vertical spline means spanning across said vertical gap, engaging said vertical recesses, and being movable out of engagement with either of said vertical recesses thereby releasibly retaining said panels.

5,065,558

PREFABRICATED MODULAR BUILDING CONSTRUCTION SYSTEM

W. Harley Boatsman, Portland, Oreg., assignor to Gibraltar World International, Ltd., Portland, Oreg.

Continuation-in-part of Ser. No. 299,629, Jan. 23, 1989, abandoned. This application Dec. 26, 1989, Ser. No. 456,315
Int. Cl.[5] E04B *2/78, 2/38*
U.S. Cl. 52—239 **18 Claims**



1. A prefabricated building structure, comprising:

(a) a plurality of upright column members each defining a laterally open V-shaped groove extending vertically therealong;

(b) a horizontal frame assembly including a plurality of horizontal frame members, each respectively defining an upwardly-open V-shaped channel and a downwardly-open V-shaped channel, the horizontal frame assembly further including a plurality of corner connectors, interconnecting adjacent ones of said horizontal frame members with one another, and interconnecting vertically adjacent ones of said upright column members with each other, each corner connector having four upright walls, respective ones of said walls being attached to a plurality of said horizontal frame members and said corner connectors being open upwardly and downwardly, and respective ends of said upright column members extending into and being held in respective ones of said corner connectors; and a plurality of vertical wall panels of concrete each having respective top, bottom, and end margins, at least one of said end margins being of protruding wedge-like V form corresponding to the shape of a respective one of said V-shaped groove and at least one of said top and bottom margins being of protruding wedge-like V form corresponding to the shape of a respective one of said V-shaped channels, each of said end margins being matingly received in a respective one of said laterally open V-shaped grooves, and at least one of said top and bottom margins being matingly received in one of said open V-shaped channels of said horizontal frame assembly.

5,065,559

WALL SYSTEM AND METHOD OF CONSTRUCTION

Douglas R. Zegel, Moorestown, N.J.; Gary S. Jensen, Drexel Hill, Pa.; Mark R. Hernick, Prospect Park, Pa., and Michael J. Daniels, Doylestown, Pa., assignors to Art Guild, Inc., West Deptford, N.J.

Continuation of Ser. No. 285,763, Dec. 16, 1988, Pat. No. 4,976,080. This application Sep. 13, 1990, Ser. No. 581,798
Int. Cl.[5] E04H *1/00*
U.S. Cl. 52—239 **19 Claims**

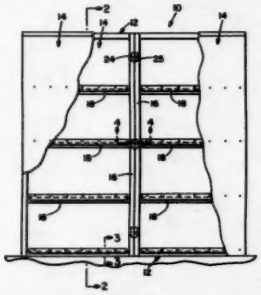
1. A wall system comprising:

(a) at least one wall frame including:

(i) a pair of spaced vertical supports,

(ii) an array of at least three cross members spanning between and rigidly connected to said vertical supports thereby fixing said vertical supports in spaced, parallel alignment; and

(iii) each of said vertical supports having means for lockingly engaging respective complementary vertical supports of a second wall frame;



(b) wall frame covering means including means for matingly engaging at least three of said cross members in unison; and

(c) said wall frame covering means matingly engaged with at least three of said wall frame cross members thereby securely mounting said wall frame covering means to one side of said wall frame.

5,065,560

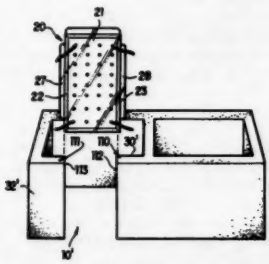
CONCRETE BLOCK INSPECTION FORMS

Eli J. Yoder, 7500 Richardson Rd., Sarasota, Fla. 34240

Filed Dec. 6, 1990, Ser. No. 623,056

Int. Cl.[5] E04B *5/46, 5/08*

U.S. Cl. 52—306 **26 Claims**



19. A combination construction block and inspection window comprising, a concrete block having upper and lower edges and a wall having a front face and an inner face and at least one interior cell, an opening from said front face into said cell, said opening being bordered on either side by side edges which extend from said front face to the inner face of the wall, the distance between said front face and said inner face of said wall being defined by a first dimension, a form means having a front face and side walls extended rearwardly therefrom, said side walls of said form means being selectively engagable with said side edges adjacent said opening, and said form means having at least one air hole opening therethrough.

5,065,561

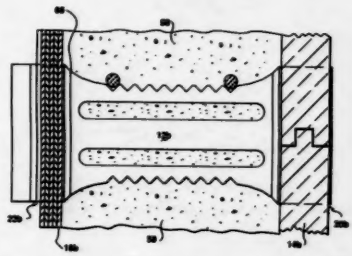
FORM WORK SYSTEM

Martin B. Mason, Danville, Calif., assignor to American Construction Products, Inc., Campbell, Calif.

Filed Oct. 19, 1988, Ser. No. 260,165

Int. Cl.[5] E04B *2/00*

U.S. Cl. 52—309.12 **11 Claims**



1. Wall form apparatus for forming wet concrete into walls, comprising:

a plurality of vertically stackable rectangularly configured panels having interlocking edges and adapted to form a pair of parallel, spaced-apart wall forms, said panels each having a plurality of tie-receiving transversely oriented slots formed along regular intervals at the top and bottom edges thereof, said slots extending vertically a and bottom edges thereof, said slots extending vertically a predetermined distance into the top and bottom edges of said panels; and

a plurality of tie means, each including an elongated bridge portion spanning between first and second shank portions, transversely extending interior flange means formed at the junctions of said bridge portions and said shank portions, and exterior flange means disposed at the distal ends of said shank portions, said shank portions having vertical dimensions substantially equal to twice said predetermined distance whereby when the lower halves of said shank portions are mated with corresponding slots in the top edges of two parallel spaced apart panels, the upper halves thereof extend above said panels such that additional panes may be stacked thereabove with their lower edge slots disposed in mating relationship with said upper halves, said interior flange means and exterior flange means being adapted to engage the interior and exterior faces respectively of said panels.

5,065,562

SEALING AND FASTENING SYSTEM FOR GREENHOUSES

Douglas C. Larsen, Milford, and Robert A. Vaughan, Dearborn, both of Mich., assignors to The Standard Products Company, Cleveland, Ohio

Filed Jan. 29, 1990, Ser. No. 471,548

Int. Cl.[5] E04D *3/14*

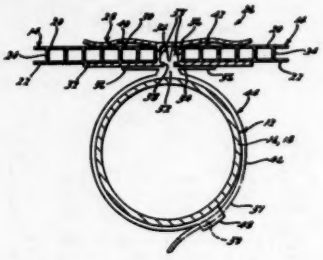
U.S. Cl. 52—772 **20 Claims**

1. A sealing and fastening system for securing a pair of adjoining panels to a frame structure for a greenhouse, comprising:

an extruded one-piece coupling having a generally "H"-shape and forming a pair of transversely spaced pockets, one edge of each panel being disposed in a corresponding pocket; and

a fastener operatively engaging said coupling and having a

wrap adapted to be disposed about a member of the frame structure to secure said coupling to the frame structure,



said wrap including a self contained fastening means for securing of the wrap to the frame structure.

5,065,563

PACKAGING MACHINE FOR CLOSING PACKAGING TRAYS OR THE LIKE AFTER FILLING, BY WELDING A FILM OF THERMOPLASTIC MATERIAL

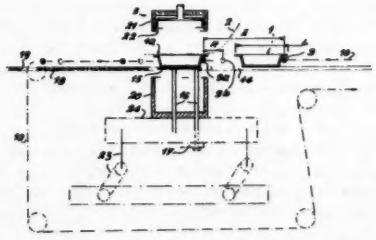
Patrick Robache, Paris, France, assignor to Mecaplastic, Bagnolet, France

Filed Oct. 19, 1990, Ser. No. 600,999

Claims priority, application France, Oct. 20, 1989, 89 13754

Int. Cl.[5] B65B *31/02*

U.S. Cl. 53—69 **5 Claims**



1. In a packaging machine for closing packaging trays or the like after filling in a filling station, comprising means for vacuum welding a plastic film on edges of said packaging trays in said filling station, and mechanical means for displacing said trays one behind the other into said filling station and then out of said station for discharge of closed packaging trays; the improvement wherein said mechanical means comprises a single endless conveyor having an upper run having thereon a series of spaced pushers which are capable each of pushing a said tray, means for advancing said upper run of said conveyor to move a said packaging tray pushed by one said pusher into said filling station, means for thereafter moving said upper run in a reverse direction to move a said pusher backward away from said tray and said filling station a distance less than the spacing between adjacent pushers so as to permit said vacuum welding means to weld thermoplastic film on said tray in said filling station, and means for thereafter reversing movement of said upper run so that said one pusher again contacts said tray in said filling station to move said tray out of said filling station and to move into said filling station another said tray propelled by another said pusher on said conveyor.

5,065,564

APPARATUS FOR THE FORMATION OF CIGARETTE GROUPS

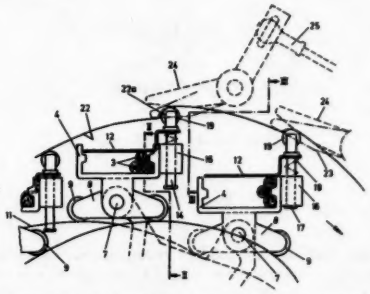
Manfred Oberdorf, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Oct. 25, 1990, Ser. No. 603,880

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1989, 3935971

Int. Cl.[5] B65B *19/10*

U.S. Cl. 53—150 **20 Claims**



1. Apparatus for forming cigarette groups comprising a plurality of layers of cigarettes for a pack, said apparatus comprising:

turret means for forming cigarette groups comprising a turret rotatable about a first axis;

cell means comprising a plurality of cells each having a floor for receiving cigarette groups, said cells being pivotally mounted to said turret means for rotation coaxially of said first axis;

funnel means comprising means defining a plurality of parallel exit orifices;

first control cam means engageable with the cell means for aligning the cells with the exit orifices at load positions;

transfer means for axially transferring a cigarette layer from an exit orifice to a cell;

tamping means for tamping a cigarette layer in each cell; and

second control cam means for adjusting the position of the tamping means relative to an associated cell floor comprising stationary cam means comprising a step for allowing displacement of said tamping means at least by the amount of the height of a cigarette layer at load positions and movable cam means for temporarily positioning the tamping means against a cigarette layer during rotation of said cell and releasing said tamping means at the load positions.

5,065,565

METHOD AND APPARATUS FOR APPLYING CARRIERS TO CONTAINERS

Frank J. DiFrank, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

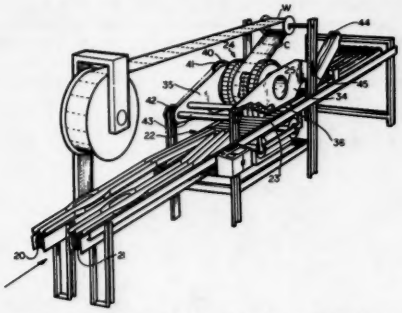
Filed Oct. 10, 1989, Ser. No. 419,346

Int. Cl.[5] B65B *21/00*

U.S. Cl. 53—398 **24 Claims**

1. A method of applying carriers to arrays of containers comprising, providing a web of interconnected plastic carriers, each carrier having an array of openings for receiving the upper ends of the array of containers, the configuration of each of the openings being slightly less than the cross section of the upper end of each of the containers, providing a plurality of containers in rows and columns, each container having an upper bead, a neck and a body portion, moving the rows of containers in a predetermined path, moving the web in a converging path with respect to the direction of movement of the containers, first engaging the trailing edges of the beads of each transverse row of containers with the trailing edges of a corresponding row of openings in said carrier web, then causing said

row of containers engaged with the trailing edge of said openings to move relative to its respective tow of openings in the carrier to thereby cause the leading edge of said engaged row of openings of said carrier web to pass down over and engage the leading edges of the beads of said engaged containers, successively engaging the trailing edges and leading edges of



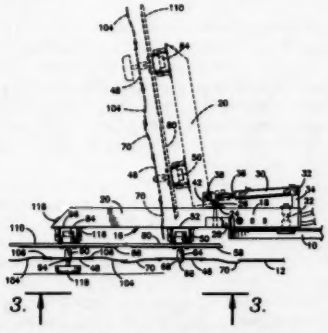
succeeding rows of containers with the trailing edges and leading edges of succeeding rows of openings in the carrier web thereby applying the carrier to the containers, and thereafter severing each carrier from the remainder of the web to form as a package, a carrier and a predetermined array of containers.

5,065,566

TRIMMER ATTACHMENT FOR MOWING DECKS

David E. Gates, R.R. 5, Box 148B, Chillicothe, Mo. 64601

Filed Dec. 7, 1990, Ser. No. 629,646
Int. Cl.[5] A01D *55/00*
U.S. Cl. 56—12.7 **20 Claims**



1. A trimmer attachment for a tractor driven mower deck, comprising:

a boom;

means for connecting said boom to extend generally horizontally from the mower deck in a manner permitting the boom to pivot about a substantially vertical pivot axis between a normal position wherein the boom extends generally laterally to one side of the deck and a deflected position wherein the boom is deflected rearwardly from the normal position when the boom encounters an obstacle;

yieldable means for urging the boom toward its normal position to return the boom to the normal position after an obstacle is cleared;

flexible line trimming means on said boom comprising a trimming head mounted for rotation on the boom and a flexible trimming line on the trimming head for trimming weeds and the like when the trimming head is rotated; and

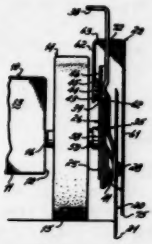
power means for effecting rotation of the trimming head.

5,065,567

LAWN EDGER

Lloyd F. Wessel, 2810 Meadow Dr., Louisville, Ky. 40220; Edward O. Wessel, 216 Dorchester Rd., Louisville, Ky. 40223, and MaryAnn Mudd, 104 Bellemeade Rd., Louisville, Ky. 40222

Filed Oct. 10, 1990, Ser. No. 595,210
Int. Cl.[5] A01D *31/00*
U.S. Cl. 56—13.7 **30 Claims**



1. Turf edging apparatus including in combination, a wheeled lawn mower having a frame, a non rotational front axle and a front wheel mounted thereon, said front wheel having a circumferential tread for rolling engagement with a surface over which the lawn mower can be rolled,

an edging disk having a turf cutting edge,

arm means mounting said edging disk on said axle for selective linear movement with respect to said axle, said disk having a disk axis,

said disk axis being radially spaced from said axle and adjustable in a linear direction about said axle independently of said frame,

said disk being rotatable about said disk axis,

said disk being movable between a stowed position above said surface and a deployed edging position wherein said turf cutting edge is disposed beyond the circumferential tread of said front wheel from said axle for edging, and

further including means for adjusting the cutting height of said mower with respect to said front axle, and independently of the position of said disk, while maintaining constant the position of said disk with respect to the position of said axle, such that adjustment of the cutting height of said mower does not affect the edging position of said disk.

5,065,568

MOWER DECK HEIGHT ADJUSTMENT MECHANISM

Stephen A. Braun, Horicon; Michael J. O'Neill, Mayville, both of Wis., and Donald L. Cutshall, Burnsville, Minn., assignors to Deere & Company, Moline, Ill.

Filed Jul. 26, 1990, Ser. No. 558,045
Int. Cl.[5] A01D *34/64, 34/68*
U.S. Cl. 56—14.9 **20 Claims**

1. A mechanism as used in the mowing of vegetation, comprising:

a base unit;

at least one ground engaging wheel supporting the base unit;

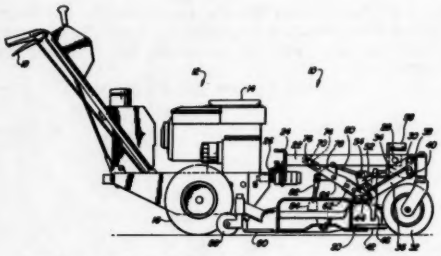
a frame fixed to the base unit, said frame and base unit being rigid with respect to relative movement about a transversely extending axis;

at least one ground engaging wheel for supporting the frame;

a deck within which vegetation may be cut, said deck being carried by the frame and having first and second portions;

means for selectively adjusting the height of the first portion of the deck above the ground without altering the height of the frame;

a bell crank means coupling the first deck portion adjustment means with the second portion of the deck for adjusting the height of the second portion of the deck, said bell crank means being adapted to shift vertically as the height of the first portion of the deck is adjusted.



5,065,569

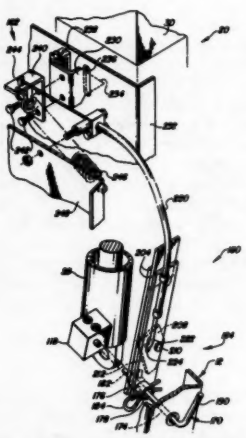
VALVE INTERLOCK SYSTEM FOR A HARVESTER HAVING AN UNLOADABLE CROP RECEIVING RECEPTACLE

Francis E. Schlueter, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 17, 1990, Ser. No. 554,212

Int. Cl.[5] A01D *46/08, 90/00*

U.S. Cl. 56—16.6 **15 Claims**



1. In a harvester having an unloadable crop receiving receptacle, a source of hydraulic fluid under pressure, a hydraulically controlled unloading mechanism, and a hydraulically controlled retracting mechanism for moving the receptacle between a compacted storage position and an expanded operating position, an interlock system for preventing operation of the unloading mechanism when the receptacle is retracted, comprising:

a valve connected to the source of hydraulic fluid and to the unloading and retracting mechanisms, said valve including operator control means moveable between a first control position wherein the source is connected to the retracting mechanism for moving the receptacle between the storage and operating positions, and a second control position wherein the source is connected to the unloading mechanism; and

a lockout control operably connected to the valve and including means responsive to the movement of the receptacle toward the compact position for preventing movement of the operator control means to the second position.

5,065,570

BI-FOLD HAY RAKE SYSTEM

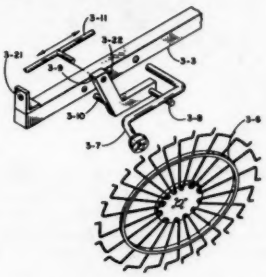
Melvin C. Kuehn, Rte. 3, Box 272, Aitkin, Minn. 56431

Continuation of Ser. No. 445,891, Nov. 24, 1989, Pat. No. 4,947,631, which is a continuation of Ser. No. 126,690, Feb. 24, 1988, abandoned. This application Jun. 13, 1990, Ser. No. 537,247

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.[5] A01D *78/12*

U.S. Cl. 56—377 **4 Claims**



1. An agricultural implement adapted for towing behind a tractor or the like to rake a harvested crop arranged in a swath along the ground into a windrow, comprising:

(a) a transport frame having a front end and a rear end, a frame centerline extending between said front and rear ends, and a pair of spaced apart, side supports on opposite sides of said centerline;

(b) ground engaging wheels operably coupled to said transport frame for supporting said frame along the ground; and

(c) a pair of wheel rake assemblies operably mounted on each side of said transport frame for shifting between a folded transport position and an extended working position, each of said wheel rake assemblies having a support beam pivotally coupled to said transport frame at a respective support beam pivot point proximal said rear end and a plurality of wheel rakes rotatably carried along the length of said support beam;

(d) each wheel rake assembly including an extensible support arm assembly, each of said support arm assemblies including a first support brace pivotally coupled at one end thereof to said support frame at a respective first support brace pivot point forward of said support beam pivot points and proximal said centerline, said first support braces each extending across a respective side support in slidable relationship therewith to a respective wheel rake assembly support beam such that each of said wheel rake assemblies is supported at least at three points by said transport frame.

5,065,571

TANGENTIAL BELT DRIVE FOR A SPINNING OR TWISTING MACHINE

Hans Stahlecker, Süssen, Fed. Rep. of Germany, assignor to Fritz Stahlecker, Fed. Rep. of Germany, a part interest

Filed Feb. 23, 1990, Ser. No. 483,713

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3905534

Int. Cl.[5] D01M *13/00*

U.S. Cl. 57—105 **11 Claims**

1. A tangential belt drive for a spinning or twisting machine equipped on each of two lateral sides with a row of a plurality of spindles, comprising;

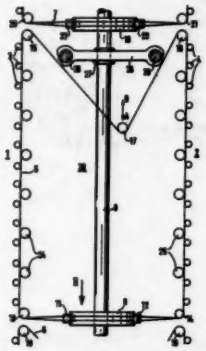
an endless tangential drive belt,

belt guides for guiding movement of the drive belt along the two lateral sides of the machine to drive the spindles,

a drive shaft extending through in the longitudinal direction of the machine in between said two lateral sides,

a belt drive disk carried by the drive shaft and drivingly engaged with the drive belt along the circumference of the drive disk above the drive shaft, said drive disk being disposed at a first longitudinal end of the two rows of spindles,

and deflecting guide means disposed at a second opposite longitudinal end of the two rows of spindles for deflecting



the travel path of the drive belt from one of said rows to the other of said rows,

wherein said deflecting guide means includes a tension roller disposed vertically above the drive shaft and rotatable about a vertical axis extending perpendicular to the plane of the drive shaft axis and located closer to the drive disk than are end most belt guides at the second end of the rows of spindles to thereby form a belt travel path with a triangular opening on the outside which faces away from the belt drive disk and serves as a mounting space for machine frame elements.

5,065,572

FIBER SUPPLY ARRANGEMENT FOR OPEN-END ROTOR SPINNING

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Filed May 9, 1990, Ser. No. 520,754

Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916238

Int. Cl.[5] D01H *4/38*

U.S. Cl. 57—413 **17 Claims**

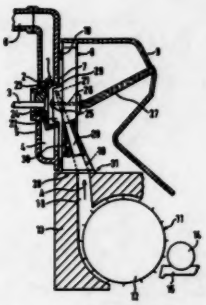
1. An arrangement for open-end rotor spinning comprising:

a spinning rotor which has a fiber sliding surface expanding conically toward a fiber collecting groove,

a fiber feeding duct having a mouth disposed opposite the fiber sliding surface, the fiber feeding duct starting at a fiber opening means and tapering in the direction toward the fiber sliding surface to define a fiber transport direction path for fibers being fed therethrough, said fiber feeding duct including at least one deflection for deflecting the fiber transport direction therethrough,

vacuum source means communicating with the fiber feeding duct mouth for creating an air flow to carry fibers in the fiber feeding duct from the opening means to the mouth,

and a bypass opening to the fiber feeding duct located outside of the rotor area and connected to further vacuum source means for withdrawing air from the fiber feeding duct and thereby increasing air flow aided fiber transport during spinning operations, said bypass opening being in bypassing relation to the mouth of the fiber feeding duct, wherein the bypass opening is disposed downstream of the deflection in the fiber transport direction and at a side of



the fiber feeding duct opposite the side of the fiber feeding duct where the fibers travel due to the deflection, whereby the fiber transport in the feeding duct during spinning operations is enhanced by the bypass opening while minimizing fiber loss through the bypass opening.

5,065,573

HYDRAULIC POWER BOOSTER INCLUDING BACKUP ACTUATOR IN ADDITION TO LEVER DEVICE, FOR BOOSTER CONTROL VALVE

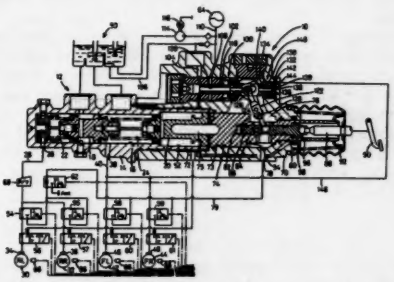
Yoshihisa Nomura, Toyota; Masahiko Kato, Toyoake; Michiharu Nishii, Toyota, all of Japan, Japan assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of Japan

Filed Jul. 16, 1990, Ser. No. 552,896

Claims priority, application Japan, Jul. 25, 1989, 1-192391

Int. Cl.[5] B60T *13/20*

U.S. Cl. 60—551 **13 Claims**



1. A hydraulic power booster having a power piston and a valve spool, for applying a pressure of a pressure source into a power chamber to advance said power piston, aid hydraulic power booster comprising:

a reaction piston movable relative to said power piston;

a lever device disposed in operative association with said reaction and power pistons and said valve spool, for moving said valve spool in one of opposite axial directions of the valve spool, in response to a relative movement between said reaction and power pistons; and

a backup actuator including a cylinder, and a valve drive piston which slidably engages said cylinder, said cylinder and said valve drive piston cooperating with each other to define a first fluid chamber communicating with said power chamber, and a second fluid chamber communicating with a pressure chamber in which a pressure is generated according to an advancing force of said power piston,

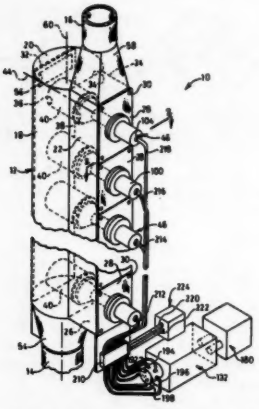
said valve drive piston moving said valve spool in said one of opposite directions, in engagement with said valve spool, when said valve drive piston is moved in a direction from said second fluid chamber toward said first fluid chamber.

5,065,574

PARTICULATE TRAP REGENERATION APPARATUS AND METHOD

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed May 29, 1990, Ser. No. 531,264
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—274 **42 Claims**



1. A particulate trap regeneration apparatus of the type including a particulate trap core having a first end opening on a duct containing exhaust gases having particulate matter therein, and allowing the egress of filtered exhaust gases from a second end thereof to another duct, the improvement comprising:

regeneration means including an apparatus for directing a source of an oxygen-containing gas at a controlled rate independent of the operation of the engine toward the second end of the trap core, heating the oxygen-containing gas, forcing the heated oxygen-containing gas to travel through the trap core and egress at the first end thereof, and controllably burning the particulate matter accumulated within the trap core in a reverse flow manner.

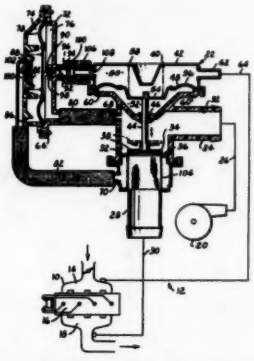
5,065,575

AIR FLOW/CHECK VALVE

John E. Cook, and Murray F. Busato, both of Chatham, Canada, assignors to Siemens Automotive Limited, Chatham, Canada

Continuation-in-part of Ser. No. 440,941, Nov. 22, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 601,095
Int. Cl.[5] F01N *3/22*
U.S. Cl. 60—290 **69 Claims**

1. In an internal combustion engine exhaust emission control system wherein an air pump delivers air to the exhaust to promote the oxidation of undesirable products of combustion in the hot exhaust gases leaving the engine but is susceptible to potential damage by backflow from the exhaust under certain exhaust conditions tending to create potentially damaging backflow toward the air pump, the improvement comprising air flow/check valve means disposed in flow controlling relationship between the air pump and the exhaust for permitting flow in the direction from the air pump to the exhaust and for blocking backflow in the direction from the exhaust to the air pump, said air flow/check valve means comprising a valving mechanism that is selectively operable to allow and disallow flow between the air pump and the exhaust, and operating means for operating said valving mechanism, said operating means comprising an actuator that is selectively positionable to cause said valving mechanism to selectively allow and disallow flow between the air pump and the exhaust, and a control means for said operating means comprising two pressure sensing taps between the air pump and the exhaust, one of which is upstream of said valving mechanism, and the other of which is downstream of said valving mechanism, and coupling means



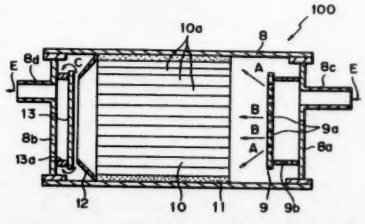
coupling said two taps with said operating means for causing said actuator to operate said valving mechanism to allow flow between the air pump and the exhaust when the pressure differential sensed by said two taps is indicative of operation of the air pump being effective to cause the pumping of air into the exhaust and for causing said actuator to operate said valving mechanism to disallow flow between the air pump and the exhaust when the pressure differential sensed by said two taps indicates a condition of the exhaust tending to create potentially damaging backflow of exhaust to the air pump.

5,065,576

EXHAUST GAS PURIFYING DEVICE FOR A DIESEL ENGINE

Hirotaka Kanazawa; Yoshitomi Fujimoto, and Michio Suzuki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Feb. 6, 1990, Ser. No. 475,700
Claims priority, application Japan, Feb. 17, 1989, 1-18062[U]
Int. Cl.[5] F01N *3/28*
U.S. Cl. 60—295 **6 Claims**



1. An exhaust gas purifying device for a diesel engine having an exhaust pipe connected therefrom, said device comprising an outer casing comprising a cylindrical member, a first end cap closing one end of said cylindrical member and having a gas inlet formed therethrough adapted for connection to said exhaust pipe, and a second end cap closing the other end of said cylindrical member and having a gas outlet formed therethrough, a catalyst-carrying honeycomb having a dust free

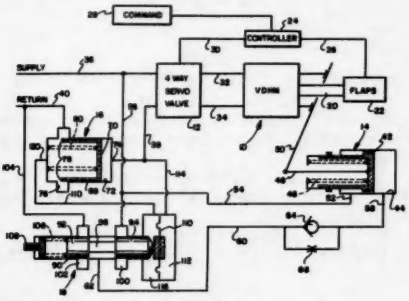
structure and arranged in said outer casing, and a baffle plate means arranged in said outer casing between said gas inlet and said catalyst-carrying honeycomb and attached to said first end cap, wherein at least one of said end caps is detachable from said cylindrical member and said catalyst-carrying honeycomb is removable from said outer casing after said end cap is detached.

5,065,577

HYDROMECHANICAL DISPLACEMENT CONTROL FOR A POWER DRIVE UNIT

Albert L. Markunas, Roscoe, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 22, 1989, Ser. No. 440,519
Int. Cl.[5] F16H *61/42, 61/46*
U.S. Cl. 60—450 11 Claims



8. A control system for a power drive unit comprising:

a variable displacement hydraulic motor;

a hydraulic actuator connected to said motor for controlling the displacement thereof;

a servo valve adapted to be connected to a source of hydraulic fluid under pressure and a controller, and connected to said motor for controlling the flow of fluid thereto in response to signals received from the controller; and

flow sensing means connected in said system for sensing flow through said motor and for providing a hydraulic control signal to said actuator, said flow sensing means including an orifice through which flow for said motor must pass and means for sensing the pressure differential across said orifice to provide said hydraulic control signal to said actuator.

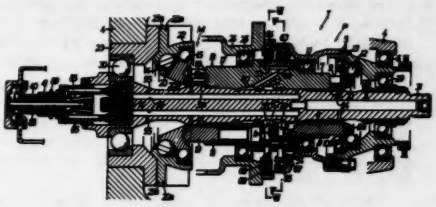
5,065,578

HYDROSTATIC CONTINOUSLY VARIABLE TRANSMISSION WITH ADJUSTABLE CLUTCH VALVE

Yoshihiro Nakajima; Mitsuru Saito; Tsutomu Hayashi, all of Tokyo; Tadashi Tsunoda; Katsumi Yamazaki, both of Saitama; Yoshihiro Yoshida, Tokyo, and Kazuhiko Nakamura, Kanagawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1989, Ser. No. 422,807
Claims priority, application Japan, Oct. 18, 1988, 63-262649
Int. Cl.[5] F16H *61/40*
U.S. Cl. 60—464 13 Claims

1. A hydrostatic continuously variable transmission comprising a hydraulic pump, a hydraulic motor, a hydraulic closed circuit between said hydraulic pump and said hydraulic motor, a clutch valve connected to said hydraulic closed circuit and capable of operating between a clutch-on position for setting said hydraulic closed circuit to a hydraulic transmitting state and a clutch-off position for setting said hydraulic closed circuit to a hydraulic transmission cut-off state, a pressure receiving chamber for urging said clutch valve to the clutch-off position upon receipt of the pressure of a high pressure portion of said hydraulic closed circuit, a pressure regulating spring means for urging said clutch valve to the clutch-on position, and a clutch controller connected to said pressure regulating



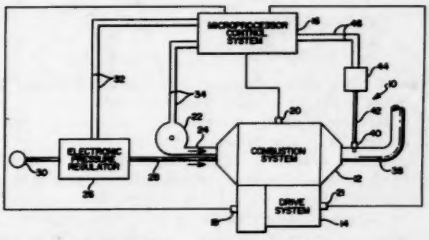
spring means and capable of regulating the set load of said pressure regulating spring means.

5,065,579

FEEDBACK AIR-FUEL CONTROL SYSTEM FOR STIRLING ENGINES

Russell Monahan, Ann Arbor, Mich., assignor to Gas Research Institute, Chicago, Ill.

Filed Oct. 12, 1990, Ser. No. 596,516
Int. Cl.[5] F02G *1/045*
U.S. Cl. 60—524 15 Claims



1. In combination with a Stirling engine having an air-fuel ratio control and an exhaust gas emission outlet, the improvement comprising:

an oxygen sensor in communication with said exhaust gas emission outlet for generating an output signal representative of the oxygen content in said outlet;

a sensor signal conditioning unit for adapting said output signal to a conditioned input signal for a microprocessor; and

a microprocessor controlled pilot for adjusting said air-fuel control in response to said control input signal.

5,065,580

TANDEM MASTER CYLINDER WITH LIMITED-MOTION BOOSTER PISTON AT PEDAL-REMOTE END OF MASTER CYLINDER AND WITH BOOSTER FLUID CUT VALVE

Michiharu Nishii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1990, Ser. No. 496,697
Claims priority, application Japan, Mar. 31, 1989, 1-083743
Int. Cl.[5] B60T *13/12*
U.S. Cl. 60—547.1 7 Claims

1. A hydraulic braking system comprising:

a master cylinder having a bore with an opening and a wall at opposite ends thereof, at least one piston slidably disposed in the bore and operatively connected to a brake pedal, at least one fluid chamber and at least one pressure chamber being defined in the bore by the at least one piston, said at least one piston having passage means formed therein for providing fluid communication between the fluid chamber and the pressure chamber, said at least one piston being provided with normally open valve

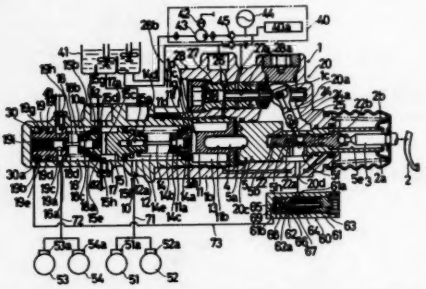
means for closing said passage means when the at least one piston is moved in response to depression of the brake pedal;

a power source for generating a hydraulic power pressure;

a dynamic hydraulic braking pressure generator which receives the hydraulic power pressure supplied from the power source and transmits output pressure regulated in response to the depression of the brake pedal;

a plurality of wheel cylinders for braking respective road wheels, divided into a first group of wheel brake cylinders connected with a first hydraulic circuit and a second group of wheel brake cylinders connected with a second hydraulic circuit;

the pressure chamber being in fluid communication with one of said hydraulic circuits; and



piston means slidably disposed between the piston and the closed wall and forming an operational chamber fluid-tightly separated from the pressure chamber and communicating with the dynamic hydraulic braking pressure generator so as to apply the output pressure of the dynamic hydraulic braking pressure generator therein to the wall end of the bore, and including restricting means for restricting movement of the piston means to a predetermined distance toward said at least one piston in response to the output pressure of the dynamic hydraulic braking pressure generator,

a cut valve means interrupting the fluid communication between the dynamic hydraulic pressure generator and the operational chamber when the output hydraulic pressure of the dynamic hydraulic braking generator is larger than a predetermined value.

5,065,581

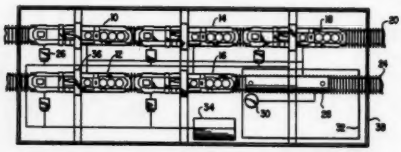
POWER PLANT AND METHOD OF PRODUCTION OF SYNCHRONOUS COMMERCIAL ELECTRIC POWER USING DIESEL ELECTRIC LOCOMOTIVES

Christopher P. Jenkins, Reisterstown, Md., assignor to Energy Resources & Logistics, Inc., Baltimore, Md.

Filed Oct. 24, 1990, Ser. No. 602,570

Int. Cl.[5] H02P *9/04*

U.S. Cl. 60—668 **8 Claims**



1. A method of producing synchronous electric power at utility transmission or subtransmission voltages to an electric utility grid during periods of peak electrical demand, the method comprising;

(a) providing at least two conventional diesel electric railroad locomotives, each having a diesel engine with a speed governor for such engine, an electrical generator driven by the engine, electrical drive motors driven from electricity provided by the generator, railroad wheels on axles driven by the drive motors,

(b) positioning the locomotives stationary at a location on railroad tracks,

(c) disconnecting the electric drive motors of the locomotives from the locomotive generator,

(d) connecting the output of the locomotive generators in parallel to generate synchronous electric power,

(e) controlling the speed of the diesel engines within the tolerances required for synchronous alternating current generation, and

(f) connecting the electrical output of the locomotive generators to step up transformer means and to an electric utility distribution grid.

5,065,582

DEWAR VESSEL FOR A SUPERCONDUCTING MAGNETOMETER DEVICE

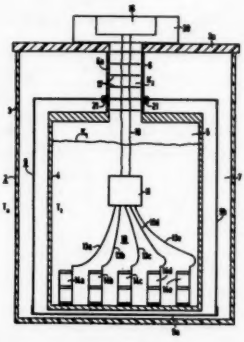
Heinrich Seifert, Bubenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 5, 1990, Ser. No. 533,297

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1989, 3918330

Int. Cl.[5] F17C *1/00*

U.S. Cl. 62—45.1 **12 Claims**



1. A high-frequency screening device surrounding an interior space of a Dewar vessel that contains a device for measuring weak magnetic fields produced by at least one field source to be detected, the vessel having a neck and an area of the interior space for accommodating superconducting parts of the measuring device to be cooled by contacting a cryogenic fluid to be supplied from outside the vessel via the neck, the cryogenic fluid having a low temperature, said screening device comprising:

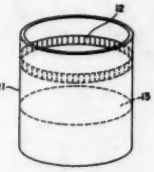
at least one surface that surrounds the area of the vessel accommodating the superconducting parts of the measuring device that is formed by individual, electrically conducting tracks which are electrically insulated from one another to suppress eddy currents, said screening device disposed outside of the interior space between an inner and outer wall of the Dewar vessel and acting as a thermal radiation shield, whereby said at least one surface of the high-frequency screening device surrounding the superconducting parts of the measuring device is maintained at a temperature level between the low temperature of the cryogenic fluid and an outside temperature of the vessel.

5,065,583

METHOD OF STORING VOLATILE SUBSTANCES, CONTAINER FOR STORING SAID SUBSTANCES, AND FLOW-CONTROL METHOD FOR SURFACE FLOW OF SUPERFLUID HELIUM

Shosuke Sasaki, Amagasaki, and Yasuyuki Kitano, Hiroshima, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 225,177, Jul. 28, 1988, Pat. No. 4,920,753.
This application Feb. 16, 1990, Ser. No. 480,874
Claims priority, application Japan, Aug. 4, 1987, 62-194596; Aug. 20, 1987, 62-205156
Int. Cl.[5] F25B *19/00*
U.S. Cl. 62—51.3 31 Claims



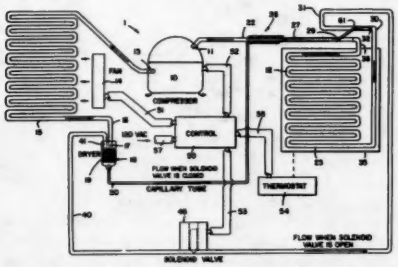
1. A container for storing liquid helium, comprising:
liquid containing means for holding the liquid helium; and
means for blocking the flow of liquid helium, wherein the helium is in a superfluid state in said container and said blocking means is provided on an inner wall surface of said liquid containing means.

5,065,584

HOT GAS BYPASS DEFROSTING SYSTEM

Dean G. Byczynski, Milwaukee, and William A. Reed, Cedarburg, both of Wis., assignors to U-Line Corporation, Milwaukee, Wis.

Filed Jul. 30, 1990, Ser. No. 559,484
Int. Cl.[5] F25B *41/00*
U.S. Cl. 62—81 4 Claims



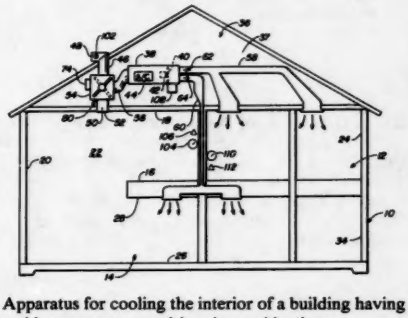
1. In a refrigeration apparatus of the type including a power driven compressor for discharging a refrigerant to an inlet of a first heat exchanger, a flow restriction device connected to an outlet of the first heat exchanger for restricting the flow of refrigerant through the first heat exchanger to thereby cause condensation of the refrigerant in the first heat exchanger, and second heat exchanger connected between an outlet of the restricting device and an inlet of the cmopressor, whereby the condensed refrigerant entering the second heat exchanger from the restriction device evaporates to thereby extract heat from the second heat exchanger, the improvement for providing defrosting for the second heat exchanger in which the refrigeration apparatus further comprises:
a bypass manifold comprising a dual port dryer including a first port connected to the first heat exchanger, a second port connected to a capillary tube restricting device emnating from the dual port dryer, and a third port which provides substantially unrestricted flow of refrigerant between the first and third ports;
a second inlet port on the second heat exchanger; and
bypass means connected between the third port of the dual port dryer and the second inlet port on the second heat exchanger, the bypass means including a flow switching device having a first state and a second state, in which flow of refrigerant through the bypass means is substantially blocked when the flow switching device is in the first state and in which flow of refrigerant through the bypass means is substantially unrestricted when the flow switching device is in the second state;
whereby when the flow switching device is in the first state the refrigerant flows substantially exclusively through the capillary tube restricting device for normal refrigeration, and when the flow switching device is in the second state the refrigerant flows substantially exclusively and unrestricted through the bypass means to thereby deliver uncondensed refrigerant to the second heat exchanger for defrosting of the second heat exchanger.

5,065,585

SYSTEM FOR COOLING THE INTERIOR OF A BUILDING

Calvin R. Wylie, Fair Oaks, and Patrick H. Crites, Orangevale, both of Calif., assignors to Beutler Heating and Air Conditioning, Inc., Sacramento, Calif.

Filed Oct. 25, 1990, Ser. No. 605,076
Int. Cl.[5] F25B *25/00*
U.S. Cl. 62—89 4 Claims



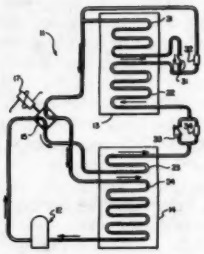
4. Apparatus for cooling the interior of a building having an attic, said apparatus comprising, in combination:
means for sensing the temperature of ambient air outside said building;
means for sensing the temperature of the air in said building interior;
means for deliverying air from outside said building into said building when a temperature differential of a first predetermined magnitude is sensed;
means for substantially terminating air flow from outside said building into said interior when a temperature differential of a second predetermined magnitude less than said first predetermined magnitude is sensed;
means for cooling air within said building interior when said air attains a predetermined temperature; and
means for venting air from said building interior into space defined by said attic while delivering air from outside said building into said building interior to relieve the build-up of air pressure within said building interior.

5,065,586

AIR CONDITIONER WITH DEHUMIDIFYING MODE

Ian Shapiro-Baruch, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 30, 1990, Ser. No. 559,744
Int. Cl.[5] F25D *17/06*; F25B *13/00*
U.S. Cl. 62—93 5 Claims



1. A vapor compressing air conditioning apparatus, having at least air cooling and air dehumidification operating modes, comprising:

a first closed refrigerant flow loop from compressor means to a first condensing heat exchanger means to second condensing heat exchanger means to first throttling means to dual function heat exchanger means to evaporating heat exchanger means to said compressor means;

a second closed refrigerant flow loop from said compressor means to said dual function heat exchanger means to said second condensing heat exchanger means to second throttling means to said evaporating heat exchanger means to said compressor means; and

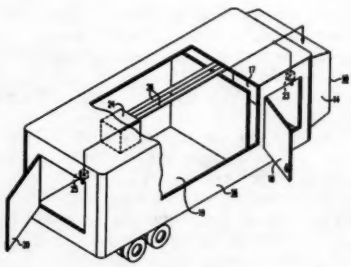
flow control means for causing refrigerant to flow through said first closed refrigerant flow loop when said apparatus is in its cooling operating mode and through said second refrigerant flow loop when said apparatus is in its dehumidifying mode.

5,065,587

COMPARTMENTALIZED TRANSPORT REFRIGERATION SYSTEM

Leland L. Howland, Belle Plaine; Jan M. Parker, Minneapolis; Doyle G. Herrig, Elko, all of Minn., and David A. Swanson, Carol Stream, Ill., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Jan. 28, 1991, Ser. No. 646,980
Int. Cl.[5] F25D *29/00*
U.S. Cl. 62—131 6 Claims



1. In a compartmentalized transport refrigeration system having front and rear compartments, first and second access doors to the front and rear compartments, respectively, first and second thermostats which respectively control the temperatures in the front and rear compartments to first and second set point temperatures via null, heating and cooling cycles, a host refrigeration unit which includes a compressor driven by a prime mover in a selected one of high and low speeds, a condenser, a receiver, a local evaporator for the front compartment, hot gas, liquid and suction lines, and a host evaporator damper, a remote refrigeration unit including a remote evaporator for the rear compartment, with the remote evaporator unit being connected to the host refrigeration unit via remote hot gas, liquid and suction lines, and electrical control for controlling the operation of the host and remote refrigeration units, the improvement comprising:

a door switch mounted to be responsive to the position of the first door,

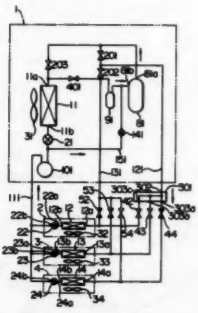
and control means in the electrical control connected to be responsive to said door switch such that said door switch, when the first door is open, causes said control means to modify the operation of the transport refrigeration system by operating the host refrigeration unit in null and by cycling the remote refrigeration unit between heating and cooling modes to maintain set point in the rear compartment.

5,065,588

AIR-CONDITIONER SYSTEM

Susumu Nakayama, Shizuoka; Kensaku Oguni, Shimizu; Hiromu Yasuda, Shizuoka; Rumi Minakata, Shizuoka; Kazumoto Urata, Shizuoka; Masatoshi Muramatsu, Shimizu; Kenji Tokusa, Shizuoka; Takao Senshu, Shizuoka; Hirokiyo Terada, Shizuoka, and Fumihiko Kitani, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 564,608
Claims priority, application Japan, Aug. 17, 1989, 1-211937; Oct. 25, 1989, 1-275869
Int. Cl.[5] F25B *13/00*
U.S. Cl. 62—160 5 Claims



1. An air-conditioner system comprising:

compressor means including an inlet port through which refrigerant flows into the compressor means and an outlet port through which the refrigerant compressed by the compressor means flows out of the compressor means;

a plurality of heat exchanger means each of which is adapted for either heating or cooling air in an air-conditioned room as occasion demands and includes a heat exchanger first port and a heat exchanger second port between which the refrigerant flows in the heat exchanger means to transfer heat energy from the refrigerant to the air in the air-conditioned room;

radiator means which includes a radiator first port and a radiator second port between which the refrigerant flows in the radiator means to transfer heat energy from the refrigerant to the outside of the air-conditioned room;

a plurality of orifice means each of which includes an orifice first port and an orifice second port between which the compressed refrigerant expands adiabatically, and each of the orifice means connected, through the orifice first port,

to the heat exchanger second port, of a respective one of the plurality of heat exchanger means, and connected to the radiator second port through the orifice second port;

manifold means including main port means and a plurality of sub-port means connected to the heat exchanger first ports, respectively, the heat exchanger first ports communicating with the main port means through the respective sub-port means in the manifold means;

flow direction control means arranged between the compressor means and the main port means and between the outlet port and the radiator first port, wherein the flow direction control means flows the refrigerant from the outlet port to the main port means and does not flow the refrigerant from the main port means to the inlet port when at least one of the heat means is heating the air in the air-conditioned room, the flow direction control means does not flow the refrigerant from the outlet port to the radiator first port when at least one of the heat exchanger means is heating the air in the air-conditioned room and none of the heat-exchanger means is cooling the air in the air-conditioned room, and the flow direction control means does not flow the refrigerant from the outlet port to the main port means, flows the refrigerant from the outlet port to the radiator first port and flows the refrigerant from the main port means to the inlet port when none of the heat exchanger means is heating the air in the air-conditioned room and at least one of the heat exchanger means is cooling the air in the air-conditioned room;

a plurality of valve pairs, each of the valve pairs including first valve means and second valve means, the heat exchanger first ports being connected to the respective sub-port means through the respective valve means, the heat exchanger first ports being connected to the inlet port through the respective second valve means, wherein in each of the valve pairs the first valve means opening to flow the refrigerant between the heat exchanger first port and the sub-port means when the second valve means closes thereby preventing the flow of the refrigerant between the heat-exchanger first port and the inlet port and the second valve means opening to flow the refrigerant between the heat exchanger first port and the inlet port when the first valve means closes thereby preventing the flow of the refrigerant between the heat exchanger first port and the sub-port, and wherein the first valve means which is connected to the heat exchanger means heating the air in the air-conditioned room is opened and the first valve means which is connected to the heat exchanger means cooling the air in the air-conditioned room is closed when at least one of the heat exchanger means is heating the air in the air-conditioned room, the first valve means which is connected to the heat exchanger means cooling the air in the air-conditioned room is opened when none of the heat exchanger means is heating the air in the air-conditioned room and at least one of the heat exchanger means is cooling the air in the air-conditioned room; and

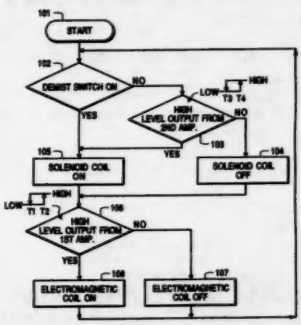
third valve means arranged between the inlet port and the radiator first port, the third valve means opening to flow the refrigerant from the radiator first port to the inlet port when at least one of the heat exchanger means is heating the air in the air-conditioned room and none of the heat exchanger means is cooling the air in the air-conditioned room, the third valve means closing thereby preventing the flow of the refrigerant from the radiator first port to the inlet port when the flow direction control means flows the refrigerant from the outlet port to the radiator first port.

5,065,589

CONTROL APPARATUS USED FOR A REFRIGERANT CIRCUIT HAVING A COMPRESSOR WITH A VARIABLE DISPLACEMENT MECHANISM

Yukihiko Taguchi, Gunma, Japan, assignor to Sanden Corporation, Isesaki, Japan

Filed Apr. 17, 1990, Ser. No. 509,772
Claims priority, application Japan, Apr. 17, 1989, 1-95330
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—161 **21 Claims**



1. In a refrigerating system including a refrigerant circuit formed by a condenser, expansion element, evaporator and compressor, said compressor including a variable displacement control mechanism, canceling means for canceling the operation of said variable displacement control mechanism, detecting means for detecting a thermal condition of said evaporator and generating a control signal, first control means for controlling the operation of said compressor in response to the control signal, and second control means for controlling the operation of said canceling means in response to the control signal, the improvement comprising:

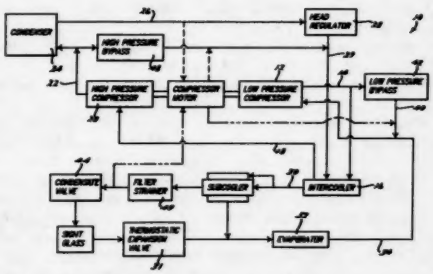
selecting means for selectively enabling one of said second control means and said canceling means, said cancelling means operating without regard to the control signal when enabled by the selecting means.

5,065,590

REFRIGERATION SYSTEM WITH HIGH SPEED, HIGH FREQUENCY COMPRESSOR MOTOR

James W. Powell, Hartland; Mark G. Voss, Brighton, and Bryan N. Waineo, Northville, all of Mich., assignors to Williams International Corporation, Walled Lake, Mich.

Filed Sep. 14, 1990, Ser. No. 582,245
Int. Cl.[5] F25B *1/10, 31/02*
U.S. Cl. 62—175 **2 Claims**



1. A refrigeration system comprising:

a high speed high frequency induction motor having a double-ended shaft with low and high pressure centrifugal

refrigerant compressors directly coupled to opposite ends of said shaft;

a flash intercooler;

a first fluid flow path from an outlet on said low pressure compressor to an inlet of said flash intercooler;

a second fluid flow path from the outlet on said low pressure compressor to the inlet of said low pressure compressor having a valve therein for controlling the flow of superheated vapor from said compressor to said flash intercooler thereby to maintain relatively constant compressor flow over a relatively wide range of conditions;

a fluid flow path from said flash intercooler to said high pressure compressor;

a condenser;

a fluid flow path from said high pressure compressor to said condenser;

a fluid flow path from said condenser communicating with the fluid flow path from said low pressure compressor to said flash intercooler;

an evaporator;

a fluid flow path from said flash intercooler to said evaporator; and

a fluid flow path from said evaporator to said low pressure compressor.

5,065,591

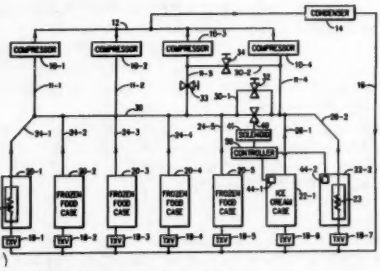
REFRIGERATION TEMPERATURE CONTROL SYSTEM

David N. Shaw, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 28, 1991, Ser. No. 646,021

Int. Cl.[5] F25B *5/00*

U.S. Cl. 62—175 **3 Claims**



1. A refrigeration system comprising:

a bank of compressors including a plurality of compressor means connected in parallel between a common suction manifold and a common discharge;

condenser means connected to said discharge;

a plurality of refrigerated compartments with at least one compartment to be maintained at a first temperature and at least one compartment to be maintained at a second temperature which is lower than said first temperature with each of said compartments including an evaporator means;

said evaporator means are connected in parallel with each of said evaporator means being connected to said condenser means through an expansion device and to said common suction manifold;

means in said common suction manifold for dividing said suction manifold into two parts and for selectively blocking fluid communication between said two parts;

all of said evaporator means in said refrigerated compartment to be maintained at said first temperature being connected to a first one of said two parts of said suction manifold;

all of said evaporator means in said refrigerated compartments to be maintained at said second temperature being connected to a second one of said two parts of said suction manifold;

one of said compressor means being connected to said second one of said two parts of said suction manifold and the remaining compressor means being connected to said first one of said two parts of said suction manifold;

means responsive to any of said refrigerated compartments to be maintained at said second temperature being at a temperature above said second temperature for causing said means in said common suction manifold to block fluid communication between said two parts whereby said one of said compressor means acts as a satellite compressor with respect to all of said evaporator means connected to said second one of said two parts of said suction manifold which are thereby maintained at said second temperature.

5,065,592

COLD BOX

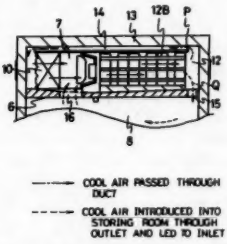
Yoshiaki Takano; Koichi Sato, both of Oizumi, and Yutaka Shimose, Menuma, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 10, 1990, Ser. No. 566,248

Claims priority, application Japan, Aug. 11, 1989, 1-208080; Nov. 17, 1989, 1-300210

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—180 **7 Claims**



1. A cold box comprising:

a freezing room;

a cold-heat accumulating agent stored in said freezing room;

a commodity storing room separated from said freezing room;

an evaporator connected with a compressor to form a freezing cycle;

first air-blowing means for circulating a first cooled air flow between said evaporator and said freezing room, said cooled air flow cooling said cold-heat accumulating agent;

second air-blowing means for circulating a second cooled air flow between said freezing room and said commodity storing room, said second cooled air flow being cooled by heat transfer between said second air flow and said cold-heat accumulating agent;

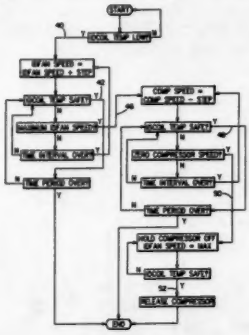
an operation control device for directing said compressor, said first air-blowing means and said second air-blowing means to operate; and

said operation control device comprising temperature setting means for setting a freezing temperature for said freezing room and a storing temperature for said storing room, first control means for detecting the temperature in said freezing room and directing said compressor to stop operating when the detected temperature is not higher than said set freezing temperature, and second control means for detecting the temperature in said storing room and directing said second air-blowing means to stop operating when the detected temperature is not above said set storing temperature.

5,065,593
METHOD FOR CONTROLLING INDOOR COIL FREEZE-UP OF HEAT PUMPS AND AIR CONDITIONERS

Kevin F. Dudley, Cazenovia; Kevin B. Dunshee, Syracuse, and Alan D. Abbott, Manlius, all of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 18, 1990, Ser. No. 584,254
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—182 **7 Claims**



1. In a heat pump system for heating or cooling a comfort zone having variable speed indoor and outdoor fans, indoor and outdoor coils and a variable speed compressor, the method of controlling indoor coil freeze up during cooling operation which comprises the steps of:

sensing the temperature of the indoor coil;

sensing the indoor fan speed and the compressor drive speed;

increasing the indoor fan speed when the indoor coil sensed temperature drops below a first predetermined point;

sensing the indoor coil temperature again;

reducing the compressor drive speed if the increasing fan speed has not raised the indoor coil temperature above a second predetermined point;

sensing the indoor coil temperature again;

shutting off the compressor if the reduced compressor drive speed has not raised the indoor coil temperature above the second predetermined point;

sensing the indoor coil temperature again;

returning the indoor fan and compressor drive speeds to normal when the indoor coil temperature rises above the second predetermined point.

5,065,594
AUTOMATIC PURGER FOR ABSORPTION HEAT PUMP

Yuh-Yuan Yo, Chutung, Taiwan, assignor to Industrial Technology Research Institute, Taiwan, Taiwan

Filed Sep. 12, 1990, Ser. No. 581,546
Int. Cl.[5] F25B *43/04*
U.S. Cl. 62—195 **2 Claims**

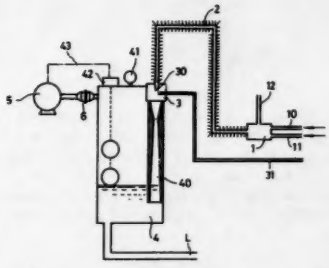
1. An automatic purger for an absorption heat pump having a generator for generating high density absorbing agent solution by heating low density absorbing agent solution, a condenser for condensing vapor refrigerant evaporated when heating absorbing agent solution in said generator, an evaporator for transforming the condensed refrigerant coming from said condenser into vapor refrigerant so as to achieve a cooling effect, an expansion valve connected between said condenser and said evaporator, and an absorber for absorbing the vapor refrigerant coming from said evaporator by absorbing agent so as to form low density absorbing agent solution to be fed back to said generator, the automatic purger comprising:

an eductor having a first inlet connected to said absorber, a second inlet connected to said generator, a first outlet, and a second outlet connected to said absorber;

a storage tank connected to said absorber;

a solution level controller having a first portion mounted in the storage tank and a second portion mounted exteriorly of the storage tank, the first portion including a float for floating on solution in the storage tank and the second portion including control means for activating and deactivating purging of the storage tank, the float and control means being operatively connected;

a purging chamber connected to said absorber and having a nozzle mounted therein which is connected to said first outlet of said eductor by a connecting tube so that absorbing agent solution from said eductor is ejectable into said purging chamber through said nozzle, thus forming a low pressure zone around the exit of said nozzle for extracting



non-condensable gas from said absorber into said purging chamber and for carrying said non-condensable gas into said storage tank by ejected absorbing agent solution;

a diffuser connected between said purging chamber and said storage tank for increasing pressure of absorbing agent solution ejected from said nozzle into said storage tank; and

a vacuum pump electrically coupled to said control means of the solution level controller and operatively connected to said storage tank so that said vacuum pump will be actuated by the control means to begin purging of non-condensable gas in response to the float in said storage tank reaching a predetermined low solution level, and the vacuum pump will be de-energized to stop purging in response to the float in said storage tank reaching a predetermined high solution level.

5,065,595
THERMOSTATIC EXPANSION VALVE

G. Thomas Seener, St. Louis, and Joseph H. Heffner, Chesterfield, both of Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Filed Dec. 5, 1990, Ser. No. 622,755
Int. Cl.[5] F25B *41/04*
U.S. Cl. 62—212 **6 Claims**

1. In a refrigeration system of the type which includes a compressor, a condenser, and an evaporator, an expansion valve controlling flow of refrigerant into the evaporator, the expansion valve comprising:

(a) a valve body having opposed ends, an inlet and an outlet, a valve port disposed between said inlet and said outlet, and said outlet communicating with the evaporator inlet,

(b) a valve element movable relative to the valve port to control flow through said port,

(c) a first motor means at one end of the valve body having opposed sides,

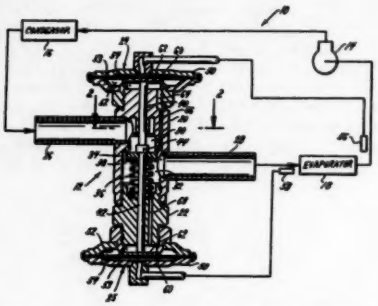
(d) first sensing means sensing the temperature of the evaporator outlet to apply a pressure to one side of the first motor means,

(e) a second motor means at the other end of the valve body having opposed sides,

(f) second sensing means sensing the temperature of the

evaporator inlet to apply a pressure to one side of the second motor means,

(g) push rod means operatively engaging the first and second motor means and tending to open the valve port in response to pressure from the first motor means,



(h) spring means within the valve body operatively engageable with the valve element and cooperating with the pressure from the second motor means tending to close the valve port, and

(i) means for communicating valve outlet pressure to the other side of each of said first and second motor means.

5,065,596

DUAL LOUVERED SIDE AIR DISCHARGE OPENINGS FOR ROOM AIR CONDITIONER

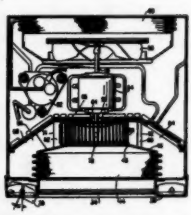
James E. Harris, Hermitage; Leonard T. Farfaglia, deceased, late of Brentwood by Mary M. Farfaglia, legal representative , and Steven D. Wetherholt, Nashville all of Tenn., assignors to Whirlpool Corporation, Benton Harbon, Mich.

Filed May 11, 1990, Ser. No. 522,199

The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] F25D *23/12*

U.S. Cl. 62—262 **19 Claims**



15. A room air conditioner comprising:

an evaporator coil centered on a center line of said air conditioner;

an air moving device for causing air to flow in a stream through an inlet in a front side of said air conditioner and then through said evaporator coil;

a housing for said air moving device having a pair of openings positioned on opposite sides of said air moving device for dividing said air stream into two separate and substantially equal air streams;

two separate air conduits being substantially equal in size and shape and being positioned symmetrically relative to said center line said openings and air conduits defining means for directing said separate and substantially equal air streams toward two separate air exit openings at said front side of said air conditioner on opposite sides of said inlet; and

an air flow outlet at an open end of each air conduit comprising a modular unit including horizontal and vertical louvers, said vertical louvers being pivotable about at least one vertical axis and said horizontal louvers being pivotable about at least one horizontal axis.

5,065,597

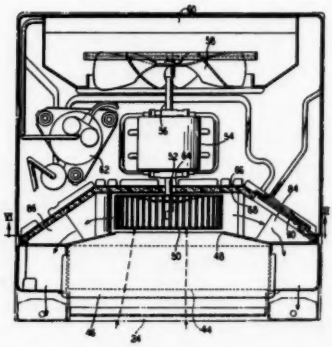
DUAL SIDE DISCHARGE AIR HOUSING FOR ROOM AIR CONDITIONER

Leonard T. Farfaglia, deceased, late of Brentwood by Mary M. Farfaglia, legal representative ; Timothy J. Campbell, Nashville; Billy P. Gipson, Marshall County; Thompson Matambo, Brentwood, and Christoper M. Thompson, Smyrna, all of Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 11, 1990, Ser. No. 522,172

Int. Cl.[5] F25D *23/12*

U.S. Cl. 62—262 **20 Claims**



1. A room air conditioner comprising:

an evaporator coil centered on a center line of and at a front side of said air conditioner;

an air moving device centered behind said evaporator coil for causing air to flow in a stream evenly through said evaporator coil;

a housing for said air moving device centered behind said evaporator coil having a pair of openings positioned on opposite sides of said air moving device for dividing said air stream into two separate and substantially equal air streams; and

two separate air conduits being substantially equal in size and shape and being positioned symmetrically relative to said center line for directing said separate air streams toward two separate air exit openings at a front side of said air conditioner, said air exit openings being substantially equal in size and shape,

said openings, air conduits and air exit openings defining means for evenly drawing air into said air conditioner, split into two relatively equal streams and directed out of said air conditioner in two streams of substantially equal air flow.

5,065,598

ICE THERMAL STORAGE APPARATUS

Yoshitaka Kurisu, Nagasaki; Hiroshi Kimura, Hyogo; Masakatsu Mukae, Nagasaki; Kazuyuki Aiba, Nagasaki; Yukihiro Hosaka, Nagasaki; Koichi Ohata; Tadaaki Nakano, both of Oosaka, and Masaki Ikeuchi, Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 576,213

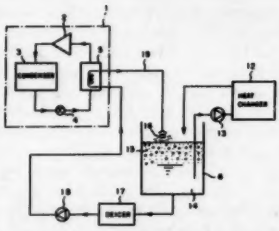
Claims priority, application Japan, Sep. 5, 1989, 1-229519; Sep. 11, 1989, 1-235180

Int. Cl.[5] F25D *3/00*

U.S. Cl. 62—330 **6 Claims**

1. An ice thermal storage apparatus which comprises a refrigerating apparatus made up of a compressor, a condenser,

a decompressing device, and an evaporator, a thermal storage material in the form of an aqueous solution prepared by adding an additive or additives to water that will be supercooled by said refrigerating apparatus, a desupercooling apparatus for relieving the supercooled state of said thermal storage material to form ice that is provided in the circuit of said thermal stor-



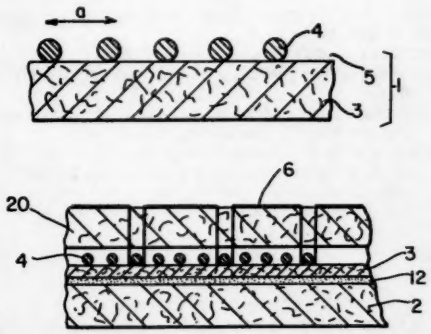
age material, a thermal storage tank for storing said aqueous solution and said ice formed by said desupercooling apparatus, a pump for sending said thermal storage material in said ice thermal storage tank into the evaporator of said refrigerating apparatus that is provided in the circuit of said thermal storage material, and a deicer for removing ice in the thermal storage material that is situated upstream of said pump.

5,065,599

TEXTILE SUPPORT OF THE KNITTED TYPE AND AN INTERLINER, CLOTH AND TEXTILE ASSEMBLY

Pierre Groshens, Peronne, France, assignor to Lainiere de Picardie, S.A., Peronne, France

Continuation of Ser. No. 174,412, Mar. 28, 1988, abandoned.
This application Sep. 29, 1989, Ser. No. 414,734
Claims priority, application France, Mar. 31, 1987, 87 04491
Int. Cl.[5] D04B 23/10, 1/00; B32B 7/04
U.S. Cl. 66—84 A 7 Claims



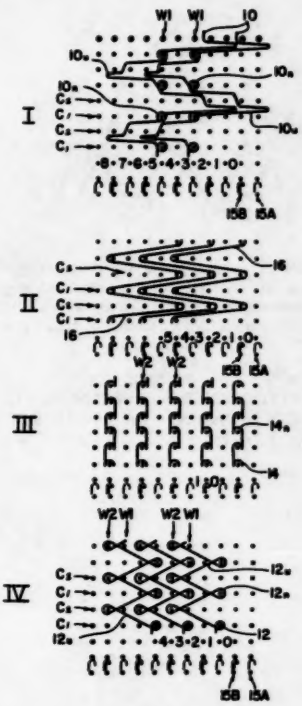
1. A structure comprising an interlining fabric, and means on one surface of said fabric for joining said fabric to a cloth in facing relationship of said one surface to the cloth, said interlining fabric comprising a fabric body having a free surface opposite said one surface, said fabric body further comprising means for receiving a basting thread for securing a second cloth to said interlining fabric, said basting thread receiving means comprising threads with floats of sufficient looseness that they may extend in spaced relation to said free surface.

5,065,600

TEXTILE FABRIC WITH OPPOSED ABSORBENT AND NON-ABSORBENT LAYERS AND METHOD OF FABRICATING SAME

Michael N. Byles, High Point, N.C., assignor to Guilford Mills, Inc., Greensboro, N.C.

Filed Nov. 30, 1989, Ser. No. 444,546
Int. Cl.[5] D04B 7/12
U.S. Cl. 66—193 25 Claims



1. An integrally fabricated textile fabric characterized by a liquid permeable non-absorbent layer at one face of said fabric adapted for initial liquid contact in use of said fabric and a liquid retaining absorbent layer at the opposite face of said fabric for wicking of liquid from said non-absorbent layer to, and retention of wicked liquid by, said absorbent layer while maintaining said non-absorbent layer essentially dry to touch, said fabric comprising hydrophobic yarn formed in a raised surface construction predominantly at said one face of said fabric to form said non-absorbent layer, hydrophilic yarn formed in a relatively dense extended pile construction predominantly at said opposite face of said fabric to form said absorbent layer, and generally inelastic ground yarn formed in a dimensionally stable generally non-stretchable construction, each of said hydrophobic, hydrophilic and ground yarns being intermeshed with at least one of the other for integrating said absorbent and non-absorbent layers, said raised surface construction of said hydrophobic yarn in said non-absorbent layer sufficiently covering said ground and hydrophilic yarns with sufficiently small interstices in said non-absorbent layer to permit liquid permeation therethrough to said absorbent layer while serving to resist leakage of absorbed liquid from said absorbent layer through said non-absorbent layer.

5,065,601

STRETCHABLE RASCHEL GOODS

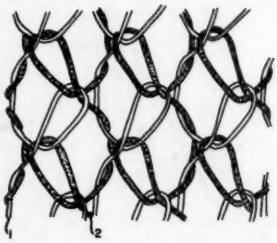
Josef Kaufmann, Münchwilen, Switzerland, assignor to Schweizerische Gesellschaft fur Tullindustries, AG, Munchwilen, Switzerland

Filed Dec. 1, 1988, Ser. No. 278,834

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1987, 3740809

Int. Cl.[5] D04B *21/00*

U.S. Cl. 66—195 5 Claims



1. Stretchable Raschel goods wherein longitudinally arranged threads are interconnected by loop and loop, wherein loop and loop are laid according to a repeat L1: 2-0/4-4//, L2: 0-0/2-4// and wherein threads consist of glass yarn.

5,065,602

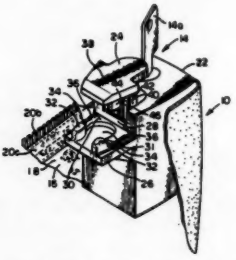
LOCKABLE CONTAINER FOR SECURING VALUABLES

George W. Williams, Nanticoke, and Arnold S. Rifkin, Wilkes-Barre, both of Pa., assignors to A. Rifkin Co., Wilkes-Barre, Pa.

Filed Jan. 18, 1991, Ser. No. 642,960

Int. Cl.[5] E05B *67/38*

U.S. Cl. 70—68 6 Claims



1. A lockable container for securing valuables comprising:

a container including an interior portion, said container having an access opening and a closure member positioned thereon, said closure member having an open position for allowing access to said interior portion of said container through said access opening and a closed position where said closure member closes said access opening such that said interior of said container is not accessible; and

a locking member positioned on said container proximate said closure member, said locking member comprising a body and a retainer member slidably attached to said body generally exteriorly to the container, said retainer member having a locked position with respect to said body for locking said closure member in said closed position and an unlocked position for allowing said closure member to move between said closed and open positions, said body including a receiver extending from an inner end surface of said body along said access opening, said receiver having an upper surface including at least two lower lugs extending generally upward from the upper surface of the receiver, each lower lug having a lower lug side extending generally perpendicular to said receiver, said lower lugs being spaced from the inner end surface of said body whereby at least two gaps are formed between said inner end surface of said body and said lower lug side of said lower lugs, said retainer member including a flange extending from an inner end surface of said retainer member along said access opening, said flange having a lower surface generally parallel to the upper surface of the receiver and at least two upper lugs extending generally downward from the lower surface of said flange member towards said receiver, each upper lug having an upper lug side extending generally perpendicular to said flange, said upper lugs being correspondingly positioned within said gaps when said retainer member is in said locked position such that said lower lug sides of said lower lugs are correspondingly positioned adjacent said upper lug sides of said upper lugs with a portion of said closure member positioned therebetween to thereby inhibit said portion of said closure member from moving with respect thereto.

5,065,603

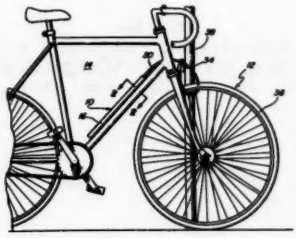
TUBULAR BICYCLE LOCK AND METHOD FOR MOUNTING SAME

Harrell F. Kloke, 1050 Santiago Dr., Newport Beach, Calif. 92660

Continuation-in-part of Ser. No. 498,650, Apr. 26, 1990, abandoned. This application Feb. 19, 1991, Ser. No. 656,459

Int. Cl.[5] B62H *5/00;* E05B *71/00*

U.S. Cl. 70—233 19 Claims



1. A method of permanently fastening a lock onto a bicycle frame comprising the steps of:

providing a length of tubular bicycle frame;

providing a tube having a longitudinal groove formed therein;

providing a double-sided tape for bonding the formed tube onto said length of tubular bicycle frame; and

assembling the double-sided tape adjacent the tubular bicycle frame and the longitudinal groove of the formed tube while the tubular frame and the longitudinal groove of the tube are parallel with each other to bond the tube to the tubular bicycle frame.

5,065,604

IGNITION INTERLOCK SYSTEM

Greg R. Pattock, Spring Lake, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jun. 11, 1990, Ser. No. 535,763

Int. Cl.[5] B60R *25/00*

U.S. Cl. 70—239 11 Claims

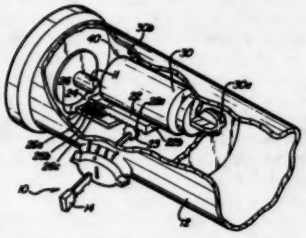
1. An ignition interlocking mechanism for use on a vehicle, comprising:

(a) an ignition switch mechanism movable by an operator to "Run", "Off" and "Lock" positions, said ignition switch mechanism including a reciprocable member movable in response to movement of the ignition switch mechanism, said reciprocable member having a stop surface thereon,

(b) a transmission selector movable between a drive position and a "Park" position,

(c) a locking member disposed proximate the reciprocable member for movement to a locking position relative to the stop surface to prevent movement of said reciprocable member or to an unlocking position relative to the stop surface to free said reciprocable member for movement in response to movement of said ignition switch mechanism,

(d) an electrical actuator energizable to move the locking member from the locking position to the unlocking position,



(e) means for moving the locking member to the locking position when the electrical actuator is deenergized, and

(f) a control circuit operable in response to the transmission selector being in the "Park" position to energize said electrical actuator and in response to the transmission selector being in the drive position to deenergize said electrical actuator when the ignition switch mechanism is in the "Off" position such that movement of the ignition switch mechanism from the "Off" position to the "Lock" position is prevented unless the transmission selector is in the "Park" position.

5,065,605

METHOD OF FORMING SHAPED CONFIGURATION AT END OF LONG ELEMENT

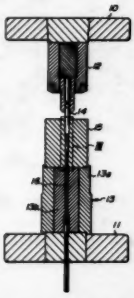
Katsuo Takahara, Oota; Shigeru Okajima, Isesaki, and Tugio Onodera, Sawa, all of Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Japan

Filed May 11, 1990, Ser. No. 522,261

Claims priority, application Japan, May 17, 1989, 1-123297

Int. Cl.[5] B21D *28/00, 45/00*

U.S. Cl. 72—340 **15 Claims**



1. A method of forming a shaped configuration at an end of a long element, comprising the steps of:

(a) placing a material with a uniform cross section along its length in an inside of a die which is provided therein with a section for forming a shaped configuration and a section for forming a body of a long element, said shaped configuration forming section lying at a front end portion of said die with respect to a direction in which the material is forced, said long element body forming section gradually increasing in inner diameter from the shaped configuration section to a rear end portion of said die so as to provide a gap between an outer surface of said material and an inner surface of said die gradually increasing from said shaped configuration section to said rear end portion of said die when said material is placed inside said die;

(b) pressingly inserted a punch into said die to forge the material;

(c) subsequently pushing said forged material out of said die by a knock-out pin which is inserted in said die from an opposite direction to the direction in which said material is forced; and

(d) subsequently forming said forged element into a shape of a substantially uniform cross section along its axis.

5,065,606

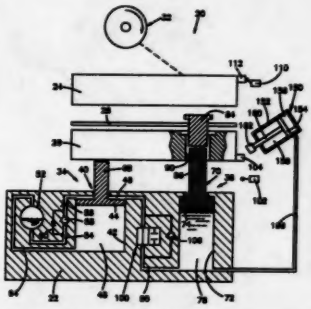
PRESS ASSEMBLY WITH CUSHION ASSEMBLY AND AUXILIARY APPARATUS

Paul M. Kadis, Chardon, Ohio, assignor to Teledyne Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 429,200, Oct. 30, 1989, Pat. No. 5,003,807. This application Oct. 12, 1990, Ser. No. 596,525

Int. Cl.[5] B21D *24/16*

U.S. Cl. 72—348 **108 Claims**



1. A press assembly operable from an open condition to a closed condition to deform a workpiece, said press assembly comprising a first movable member for engaging a first side of the workpiece, a second movable member for engaging a second side of the workpiece, said first member being movable in a first direction toward said second member during operation of said press assembly from an open condition toward a closed condition, said first and second members being movable together in the first direction with at least a portion of the workpiece disposed between said first and second members during operation of said press assembly from the open condition toward the closed condition, a cushion assembly operable toward a retracted condition to provide a yieldable force opposing movement of said second member in the first direction during operation of said press assembly from the open condition toward the closed condition, said first member being movable in a second direction opposite to the first direction during operation of said press assembly from the closed condition toward the open condition, control means for initiating movement of said second member in the first direction prior to movement of said first and second members together in the first direction during operation of said press assembly from the open condition toward the closed condition and for maintaining said cushion assembly in the retracted condition during at least an initial portion of the movement of said first member in the second direction during operation of said press assembly from the closed condition toward the open condition, and auxiliary means for performing an operation on the workpiece while the workpiece is in said press assembly, said control means including means for supplying energy during operation of said press assembly from the open condition to the closed

condition to effect operation of said auxiliary means, said auxiliary means includes means for compressing fluid as said auxiliary means is operated from a first condition to a second condition during the performance of an operation on the workpiece by said auxiliary means, said auxiliary means including means operable under the influence of the compressed fluid to operate said auxiliary means from the second condition to the first condition after completion of the operation on the workpiece by said auxiliary means.

5,065,607

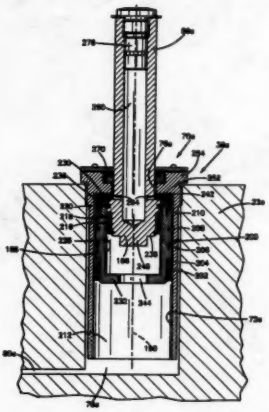
PISTON AND CYLINDER ASSEMBLY

Paul M. Kadis, Chardon, and Leonard L. Hiney, Ravenna, both of Ohio, assignors to Teledyne Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 429,200, Oct. 30, 1989, Pat. No. 5,003,807. This application Oct. 12, 1990, Ser. No. 596,468

Int. Cl.[5] B21D *24/14*

U.S. Cl. 72—351 **32 Claims**



1. An apparatus comprising a cylinder, a hollow outer piston disposed in said cylinder and cooperating with said cylinder to at least partially define first and second variable volume cylinder chambers, said hollow outer piston having cylindrical inner side surface, outer seal means connected with said hollow outer piston and disposed in sealing engagement with said cylinder to block fluid flow between said first and second variable volume cylinder chambers, an inner piston disposed in said hollow outer piston and cooperating with said cylindrical inner side surface to at least partially define first and second variable volume piston chambers, inner seal means connected with said inner piston and disposed in sealing engagement with said cylindrical inner side surface of said hollow outer piston to block fluid flow between said first and second variable volume piston chambers, a piston rod connected with said inner piston and extending from said inner piston through said first variable piston chamber and said first variable volume cylinder chamber to an outer end portion disposed adjacent to a first end of said cylinder, said hollow outer piston including first flange means extending radially inwardly from a first end portion of said cylindrical inner side surface of said hollow outer piston and circumscribing said piston rod, said first flange means including an inner side surface area facing toward said inner piston and engagable by a first end portion of said inner piston to limit movement of said inner piston in a first direction relative to said hollow outer piston, said first flange means including surface means cooperating with said piston rod to at least partially define a first piston opening for conducting fluid flow between said first variable volume piston chamber and said first variable volume cylinder chamber, said hollow outer piston including second flange means extending radially inwardly from a second end portion of said cylindrical inner side surface of said hollow outer piston at an end of said hollow outer piston opposite from said first flange means, said second flange means including an inner side surface area facing toward said inner piston and engagable by a second end portion of said inner piston to limit movement of said inner piston relative to said hollow outer piston, said second flange means including surface means which at least partially defines a second piston opening for conducting fluid flow between said second variable volume piston chamber and said second variable volume cylinder chamber, said inner and outer pistons being movable through operating strokes to vary the size of the first and second variable volume piston chambers and to vary the size of the first and second variable volume cylinder chambers, said inner piston being movable relative to said outer piston between a first condition in which said first end portion of said inner piston is disposed in engagement with said first flange means and said second end portion of said inner piston is spaced from said second flange means and a second condition in which said second end portion of said inner piston is disposed in engagement with said second flange means and said first end portion of said inner piston is spaced from said first flange means, said inner and outer pistons being movable together between a third condition in which said outer piston is disposed adjacent to the first end of said cylinder and a fourth condition in which said outer piston is disposed adjacent to a second end of said cylinder opposite from said first end of said cylinder, said piston rod including surface means for at least partially defining a rod chamber in said piston rod and for at least partially defining a passage connecting said rod chamber in fluid communication with said first variable volume piston chamber and said first variable volume cylinder chamber.

5,065,608

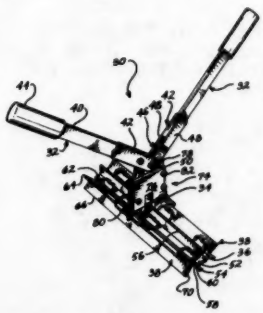
HAND-OPERATED BATTEN SEAMER TOOL

Stuart P. Skelton, 2302 Legge Rd., and Clifford W. Skelton, 2302B Legge Rd., both of Mount Vernon, Wash. 98273

Filed Aug. 20, 1990, Ser. No. 569,934

Int. Cl.[5] B21D *5/16*

U.S. Cl. 72—409 **4 Claims**



1. A hand-operated batten seamer tool for folding a preformed pair of opposed standing seams on a batten cap over to a pair of double seams, the tool comprising:

a pair of handles, each handle having a mounting end and a gripping end;

means for bracing the tool on the batten cap and for holding the batten cap to supporting structure;

a pair of elongate arms pivotally mounted to said bracing means, the arms having elongate planar faces for bearing against the standing seams;

a force multiplying means coupling the arms to the pair of handles; and,

gripping members mounted to the planar faces of the arms that engage the pair of standing seams to hold the arms in engagement with the standing seams as the arms pivot to

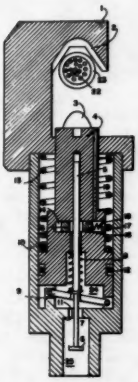
fold the pair of standing seams over to a pair of double seams.

5,065,609

PRESS FOR PRESSING OF CASINGS, CABLE SHOES OR SIMILAR ITEMS

Helmut Dischler, Neuss-Uedesheim, Fed. Rep. of Germany, assignor to Novopress GmbH, KG, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,928
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3235040
The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.
Int. Cl.[5] B21J 9/18
U.S. Cl. 72—453.15 20 Claims



1. Press for pressing of casings, cable shoes or the like, comprising a press body for receiving an upper die, a cylinder connected to the press body, a slidable press plunger disposed within the cylinder for receiving a lower die, a displaceable steering element coaxial with the press plunger, wherein the steering element is supported against a drive, communicating with a press plunger, and with the cylinder, whereby, upon movement at a given speed of the press plunger in the working direction of the steering element, the steering element moves at a fraction of the speed of the press plunger, and further comprising locking means communicating with the press plunger, whereby upon contact of the lower die with the workpiece to be pressed, the steering element is locked to the press plunger in such a way that the steering element moves with a speed equal to that of the press plunger.

15. A cylinder used in a press for pressing casings, cable shoes or the like, comprising,

a cylindrical body connected to the press,

a press plunger disposed within the cylindrical body and having an upper end extending through the press body for supporting a lower die and having a lower end defining a pressure chamber within the cylindrical body,

a steering element coaxial with an slideably received in a longitudinal bore in the press plunger,

a level pivotally connected at one end to the cylindrical body and at the opposite end to the lower end of the press plunger, the lever having a central passageway through which the steering element extends,

a valve plate disposed at an end of the steering element protruding beyond the pressure chamber and into a fluid pressure passageway,

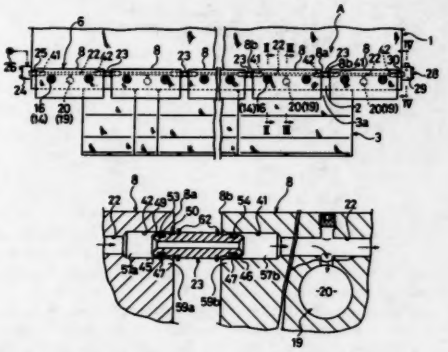
and a collar fixedly attached to the steering element, whereby as fluid pressure enters the pressure chamber through the passageway, the press plunger moves in the direction of the fluid pressure, causing upward pivoting of the lever which moves the steering element in the same direction as the press plunger, but at a fractional speed.

5,065,610

CLAMPING APPARATUS FOR PRESS BRAKE

Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha Kosmek, Kobe, Japan

Filed Feb. 27, 1991, Ser. No. 661,138
Claims priority, application Japan, Mar. 12, 1990, 2-62159
Int. Cl.[5] B21D 37/04
U.S. Cl. 72—462 6 Claims



1. A clamping apparatus for a press brake, adapted to fix an upper portion (3*a*) of an upper-die (3) to a lower portion (2) of a ram (1) extending in a horizontal direction, said clamping apparatus comprising:

a first clamping member (5) disposed on a first surface side of said ram lower portion (2);

a second clamping member (6) disposed on a second surface side of said ram lower portion (2), said second clamping member (6) being composed of a plurality of press plates (8) (8) arranged side by side in a horizontal direction;

each of said press plates (8) having a first lateral end surface (8*b*) and a second lateral end surface (8*a*); an unclamping actuation means (13) for moving said press plates (8) away from said first clamping member (5); and a clamping actuation means (14) for bringing the press plates (8) closer to said first clamping member (5), at least one of said unclamping and clamping actuation means (13) (14) comprising a hydraulic cylinder (19);

an operating oil chamber (20) of said hydraulic cylinder (19) being formed within said press plate (8);

a pressurized oil inlet port (41) opened in the first lateral end surface (8*b*) of said press plate (8) and connected to said operating oil chamber (20) for fluid communication therewith;

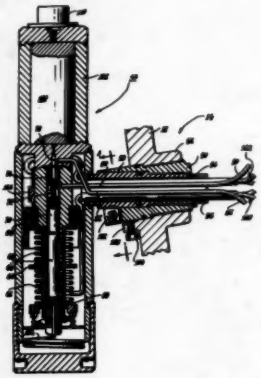
a pressurized oil outlet port (42) opened in the second lateral end surface (8*a*) of said press plate (8) and connected to said operating oil chamber (20) for fluid communication therewith with said pressurized oil inlet port (41) and said pressurized oil outlet port (42) of adjacent press plates (8) (8) facing each other;

an interconnection pipe (23) for connecting said pressurized oil outlet port (42) and said pressurized oil inlet port (41) of adjacent press plates (8) (8) for fluid communication therebetween.

5,065,611
SYSTEM FOR CALIBRATING THE SPAN OF PRESSURE MEASURING INSTRUMENTS

John P. Angelosanto, North Attleboro, and George E. Sgourakes, Millis, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Aug. 15, 1989, Ser. No. 394,013
Int. Cl.[5] G01L *27/00, 19/04, 19/12*
U.S. Cl. 73—4 R 33 Claims



1. In a pressure-measuring instrument of the type comprising means to receive an input pressure to be measured and sensing means responsive to the input pressure for producing a corresponding measurement signal;

said instrument further including a reference pressure device comprising means forming a cavity containing a fill-fluid communicating with said sensing means; an object in the cavity fill-fluid and movable between upper and lower positions; said object having at least a part thereof sized to provide a close fit with walls defining said cavity so that said part when moved by the force of gravity down through said cavity will produce a reference pressure for said sensing means to provide for calibration of said instrument; and power means for raising said object to said upper position from which it can descend under the force of gravity to produce said reference pressure;

that improvement in said instrument wherein said power means for raising said object includes:

a pair of coils positioned one above the other with their axes aligned;

said coils being arranged so as to produce opposed magnetic fields when energized; and

a vertically-movable force element comprising a permanent magnet positioned within said coils and responsive to said magnetic fields, said force element being shiftable upwards when said coils are energized thereby to lift said object to its upper position from which it can descend under gravity to develop said reference pressure.

5,065,612
METHOD OF CORRECTING ZERO POINT OF GYRO AND APPARATUS THEREFOR

Akihiro Ooka, and Kazuo Hirano, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 8, 1989, Ser. No. 404,402
Claims priority, application Japan, Sep. 28, 1988, 63-245703
Int. Cl.[5] G01P *21/00*
U.S. Cl. 73—1 D 4 Claims

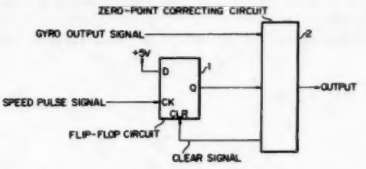
1. A method of correcting a zero point of a gyro, comprising the steps of:

detecting a speed of a moving body and outputting a speed signal corresponding to said speed;

when said speed signal is less than a predetermined reference for a first predetermined period of time from a certain time, determining that said moving body is in a stopped condition;

computing an average value of output values of the gyro for a second predetermined period of time immediately after said first predetermined period of time, and setting a zero point correction value to said average value;

determining whether said speed signal is less than said predetermined reference for a third predetermined period of time immediately after said second predetermined period of time; and

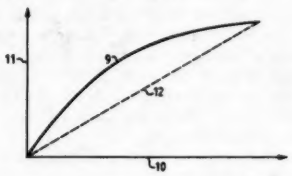


when said speed signal is less than said predetermined reference for all said first, second and third predetermined periods of time, setting the zero point of the gyro to an updated value corresponding to said zero point correction value and correcting an output value of the gyro with said updated value of said zero point.

5,065,613
METHOD FOR THE DIRECT PRESENTATION OF A DIFFERENTIAL MEASURED QUANTITY IN TERMS OF ITS CORRECT PHYSICAL UNIT

Michael Lehnert, Rodenbach; Ulrich Modlinski, Alzenau-Albstadt, and Rudi Roess, Bruchkoebel, all of Fed. Rep. of Germany, assignors to Rosemount GmbH & Co., Fed. Rep. of Germany

Filed Mar. 19, 1990, Ser. No. 495,101
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1989, 3940141
Int. Cl.[5] G01N *7/00*
U.S. Cl. 73—23.2 5 Claims



1. A method for obtaining the direct measurement of a differential gas concentration in a gas analyzer comprising the steps of:

measuring a detector output signal at a plurality of levels respectively corresponding to a plurality of input gas concentrations, said detector having a non-linear relationship between said plurality of levels and said plurality of input gas concentrations;

plotting a characteristic curve in an absolute coordinate system based on said plurality of detector output signals and said plurality of input gas concentrations, said absolute coordinate system having a defined scaling;

defining a reference value on said characteristic curve, said reference value corresponding to a level at which a differential gas measurement is to take place;

using said reference value as an origin of a differential coordinate system, said differential coordinate system having a

scaling equal to said scaling of said absolute coordinate system;

measuring a concentration of a gas to be measured using said detector, said detector having an output level corresponding to said concentration of said gas to be measured;

locating said output level along said characteristic curve;

directly ascertaining a differential measurement value in said differential coordinate system based on said output level located on said characteristic curve;

displaying said differential measurement value on said gas analyzer.

5,065,614

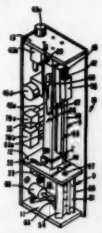
SHORT PATH THERMAL DESORPTION APPARATUS FOR USE IN GAS CHROMATOGRAPHY TECHNIQUES

Thomas G. Hartman, Staten Island, N.Y.; John J. Manura, Pennington, N.J.; Santford V. Overton, Ringoes, N.J.; Christopher W. Baker, Lambertville, N.J., and John N. Manos, Trenton, N.J., assignors to Rutgers University, New Brunswick, N.J.

Filed Jul. 31, 1990, Ser. No. 560,440

Int. Cl.[5] G01N *30/18*

U.S. Cl. 73—23.35 **4 Claims**



1. A short path thermal desorption apparatus for use in a gas chromatography-detector (GC-DET) system comprising:

a. housing means disposed for operative relation with the GC-DET system,

b. an elongated injection assembly disposed for sliding movement in the housing means from a normally disengaged position to an engaged position with the GC-DET system including, a detachably connectible generally hollow desorption tube means for collecting and storing a sample of a component to be desorbed and delivered to the GC-DET system for identification and quantification, and a needle injection means for injecting the desorbed sample of the component into the GC-DET system,

c. means connected to a source of carrier gas and to said injection assembly for charging the carrier gas into the desorption tube for desorption of the component sample on heating of the desorption tube, and

d. heating means pivotally mounted in said housing means including, coacting heating block members disposed for bilateral movement from an open to a closed position and vice versa for engaging and heating the desorption tube when the injection assembly is moved to the engaged position.

5,065,615

PASSIVE ATMOSPHERIC LIQUID WATER MEASURING SYSTEM AND PROCESS

Geoffrey E. Hill, 2300 Canyon Blvd., Boulder, Colo. 80302

Filed Mar. 8, 1990, Ser. No. 490,173

Int. Cl.[5] G01W *1/00*

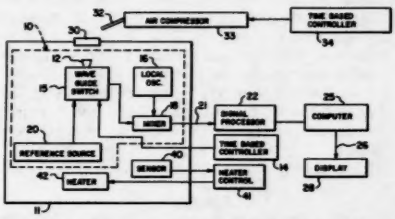
U.S. Cl. 73—29.01 **6 Claims**

1. A system for determining the liquid content in the atmosphere above a given location comprising:

a microwave radiometer including an antenna positioned to detect microwave signals emitted from the atmosphere above the given location with said radiometer operating at a substantially single frequency within the range of about 27 GHz to ΔGHz,

means for converting signals received at said radiometer to an output signal having a magnitude correlated to the magnitude of the microwave signal received by said antenna, and

means utilizing said converted signal magnitude for producing an output indicative of the liquid content of the atmosphere emitting the microwave signals and based upon predetermined quantities of other constituents in the atmosphere above the given location,



said utilizing means including, means for storing data reflecting a predetermined relationship of the magnitude of said converting means output signals to an output indicative of the liquid content of the atmosphere based upon predetermined quantities of other constituents including vapor and oxygen in the atmosphere above the given location, and means for comparing said converting means output signal with the data stored in said storing means for producing an output indicative of the amount of liquid contained in the atmosphere from which the received microwave signals were emitted.

5,065,616

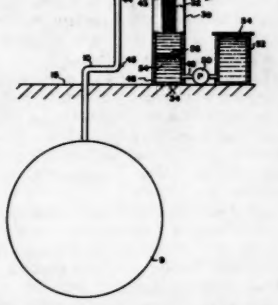
HYDROSTATIC LINE TESTING AND METHOD

Peter Schuster, 211 E. Grove, Kawkawlin, Mich. 48631

Continuation-in-part of Ser. No. 345,688, May 1, 1989, Pat. No. 4,945,757. This application Nov. 28, 1989, Ser. No. 442,072

Int. Cl.[5] G01F *23/14*

U.S. Cl. 73—49.2 **9 Claims**



1. Apparatus for testing whether a pipe which is closed at one end and filled with a first liquid, such as gasoline, having a first predetermined density is leaking comprising:

means coupled to the opposite end, opposite said one end, of said pipe for applying pressure to said first liquid in said pipe comprising

an upstanding cylinder containing a second liquid having a density equal to said first predetermined density of said first liquid;

means for coupling one end of said cylinder to said opposite end of said pipe so that the liquid in said cylinder is in intimate fluid contact with said first liquid in said pipe to be tested;

means for admitting a third liquid to the opposite end of said cylinder;

said third liquid having a density substantially different than said first predetermined density such that said second and third liquids, although in intimate contact with each other at a junction in said cylinder, remain substantially separated at said junction and substantially do not mix;

means for applying a predetermined pressure to said third liquid in said cylinder in a direction tending to force said second and third liquids in said cylinder toward said first liquid in said pipe; and

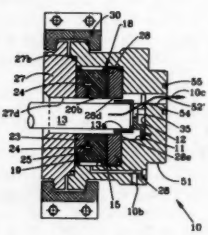
graduation means on said cylinder for providing a visual indication whether said junction of said second and third liquids in said cylinder moves toward said first end or said second end of said cylinder and thus indicate volumetric changes of the first liquid in said pipe being tested.

5,065,617

MULTIPLE DIAMETER PIPE TEST END CLOSURE

Lester W. Toelke, Bellville, Tex., assignor to Jack W. Hayden, Houston, Tex.

Filed Mar. 8, 1990, Ser. No. 490,716
Int. Cl.[5] G01M *3/28*
U.S. Cl. 73—49.8 **3 Claims**



1. A test head for enclosing the end of any one pipe of a group of pipes within a predetermined range of pipe diameters to fluid test the pipe comprising:

a longitudinal bore extending longitudinally of the test head to receive and enclose the pipe end, the longitudinal bore being greater in diameter than the largest diameter of pipe diameters within the predetermined range of pipe diameters to be enclosed by the test head;

an inwardly opening annular recess surrounding the bore in the test head and terminating in longitudinal spaced relation to the ends of the longitudinal bore;

a unitary seal ring assembly for the recess;

passage means in the test head for conducting fluid pressure to contract said unitary seal ring assembly to seal with the pipe to be tested;

said unitary seal ring assembly including an annular resilient body having an opening for receiving the pipe to be tested therethrough and an annular recess in said resilient body extending from the pipe receiving opening, at least one ring of non-resilient, movable segments and means to mount said movable segments in the recess of said resilient body for movement of said segments and resilient body into engagement with the pipe to be tested;

said non-resilient segments being mounted in said recess in said resilient body to provide a volumetric space between said non-resilient segments and resilient body to enable said resilient body and non-resilient segments to move closer to the pipe in response to fluid pressure in the passage means in the test head before said resilient body and non-resilient segments contact in a manner which applies a substantial compressive load to said resilient body for sealing engagement with the pipe; and

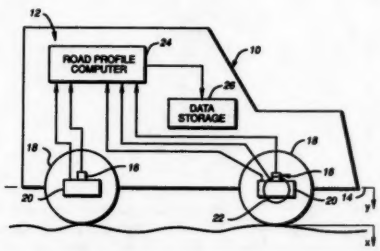
means forming seal plate surfaces adjacent each end of the recess, said seal plate surfaces having an opening therein to receive the pipe to be tested therethrough, said opening varying in diameter in relation to the diameter of pipe being tested within the multiple diameter pipe range and said means being replaceable to provide an opening clearance for the particular pipe diameter being tested within the multiple pipe diameter range and which opening reduces the diameter of the longitudinal bore to less than its maximum diameter when necessary to provide support for said unitary seal ring assembly as it contracts to sealing position on the pipe.

5,065,618

METHOD AND APPARATUS FOR DETERMINING TERRAIN SURFACE PROFILES

Hency C. Hodges, Sr.; Henry C. Hodges, Jr., both of Carson City; Sam C. Ashmore, Dayton, all of Nev., and Allan G. Piersol, Woodland Hills, Calif., assignors to Hodges Transportation Inc., Carson City, Nev.

Filed Nov. 14, 1990, Ser. No. 613,232
Int. Cl.[5] E01C *23/00*
U.S. Cl. 73—146 **15 Claims**



11. Apparatus for measuring a terrain surface vertical elevation profile comprising:

a measurement vehicle adapted to be propelled over paved or unpaved terrain to be measured and including an axle with a plurality of measuring wheels each having a hub;

force measuring means mounted at the interface of the axle and the hub of each measuring wheel for providing a first signal as a function of the force imposed by the vehicle axle on the hub as the vehicle is propelled over the terrain;

acceleration measuring means mounted at the interface of the axle and hub of each measuring wheel for providing a second signal as a function of acceleration of said hub in a direction normal to the terrain surface as the vehicle is propelled over the terrain surface;

means responsive to the vehicle travel over the terrain surface for providing a third signal indicative of vehicle speed over the terrain surface; and

means for processing an appropriate combination of said signals in the frequency domain to derive a representation of the profile of the terrain surface over which the vehicle is propelled.

5,065,619

METHOD FOR TESTING A CASED HOLE FORMATION

Glen A. Myska, Bakersfield, Calif., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Feb. 9, 1990, Ser. No. 477,391
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—152 **11 Claims**

1. A method of testing a formation comprising the steps of:

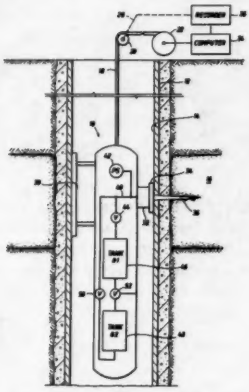
(a) lowering a formation testing tool having a test probe

which extends therefrom to a selected formation behind a casing in a well borehole;

(b) connecting the test probe into a selected formation behind the casing;

(c) connecting the test probe through a valve with a fluid receiving chamber;

(d) selectively operating the valve to fill a fluid receiving chamber with fluid from the formation;



(e) pumping a fluid volume from the testing tool into the formation through the test probe, wherein a fluid receiving chamber is the source of fluid for pumping into the formation; and

(f) measuring information fluid pressure at selected times to determine formation fluid pressure.

5,065,620

METHOD AND APPARATUS FOR MEASURING THE PRINT QUALITY OF PRINT MEDIA RECEIVING INK JET INKS

Steven J. Bares, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 358,100, May 30, 1989, abandoned, which is a division of Ser. No. 185,206, Apr. 22, 1988, Pat. No. 4,911,003. This application Nov. 8, 1990, Ser. No. 610,615

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] G01N *13/00*

U.S. Cl. 73—159 **2 Claims**

1. A method for evaluating the print quality of a porous material which includes the steps of:

a. contacting a porous surface of said porous material with a source of ink,

b. providing a known relative acceleration between said ink source and said porous surface, thereby

c. transferring a measurable volume of ink from said ink source to a known area of said porous surface, and

d. measuring the amount of ink transferred into said porous surface per unit of time, whereby the ink wetting delay and ink penetration rate into said porous surface which correlate with the ink jet print quality may be determined.

2. Apparatus for evaluating the print quality of a porous material including, in combination:

a. means for contacting a porous surface of said porous material with a source of ink,

b. means associated with said source of ink for providing a known relative acceleration between said ink source and said porous surface,

c. means adjacent to said porous surface for transferring a measurable volume of ink from said ink source to a known area of said porous surface, and

d. means connected to said source of ink for measuring the amount of ink transferred into said porous surface area per unit of time, whereby the ink wetting delay and ink penetration rate into said porous surface which correlate with the ink jet print quality may be determined.

5,065,621

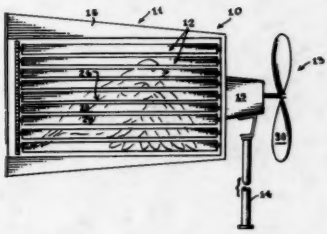
VISUALLY ENHANCED WEATHER VANE APPARATUS

Jon A. Holder, P.O. Box 481, Westminster, Md. 21157

Filed May 3, 1990, Ser. No. 519,066

Int. Cl.[5] G01P *13/02*

U.S. Cl. 73—188 **3 Claims**



1. A visually enhanced weather vane apparatus comprising:

a vertical support column;

an axle housing member having an axial bore wherein the axle housing member is pivotally connected to said support column;

a generally rectangular framework member operatively attached to said axle housing member;

a plurality of visual segment units rotatably suspended within said framework member wherein each visual segment unit comprises an elongated rectangular visual component member, wherein each of the four elongated sides of the individual visual component members have a portion of four different pictorial representations; and

means for imparting rotary movement to the plurality of visual segment units for producing a different pictorial representation on each side of the apparatus.

5,065,622

WIND DIRECTION INDICATOR

Steven E. Veenstra, 6092 Campus Park, Kentwood, Mich. 49508

Filed Aug. 31, 1990, Ser. No. 575,939

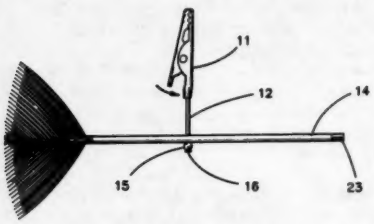
Int. Cl.[5] G01W *1/00*

U.S. Cl. 73—188 **4 Claims**

1. A wind direction indicator including a pointing beam, journal-bearing means rotatably supporting said beam for movement about a normally vertical axis, and fin means secured to said beam and adapted to orient said beam to point into a draft of air, wherein the improvement comprises:

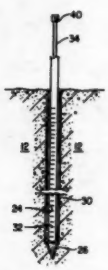
a pair of feather elements constituting said fin means, said elements having quill portions secured to said beam to dispose said elements in downwind-diverging relationship; and

said beam having a central transverse hole constituting said bearing means, and including pin means having a head



supporting said beam, said pin means traversing said hole and constituting said journal means.

5,065,623
WATER MONITOR
Allen Wilcox, R.R. 1 Box 66a, Danby, Vt. 05739
Filed Oct. 20, 1989, Ser. No. 424,659
Int. Cl.[5] G01F *23/04*
U.S. Cl. 73—290 R **4 Claims**



1. A method of monitoring the later level in the ground comprising the steps of:

vertically driving a rigid rod of a first diameter of from about 3 inches to about 6 inches into the ground by application o vertical driving force to form a v vertical casing hole of said first diameter,

withdrawing t h rod to leave the vertical casing hole in the ground with an inner wall of the original ground material which is compacted but porous and through which the ground water enters the casing hole,

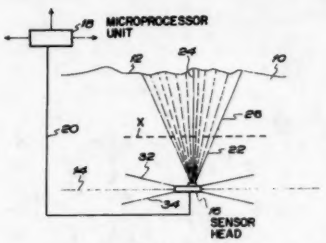
inserting into the vertical ground casing hole a tubular member of diameter from about 2 inches to about 3 inches which is smaller than the casing hole first diameter such that the outer surface of the tubular member does not contact the casing hole wall, said tubular member having an open bottom end so that the water level in the casing hole will rise within the tubular member, and

inserting a calibrated dip-stick into the tubular member and thereafter withdrawing it to measure the water level therein.

5,065,624
INSTALLATIONS FOR MEASURING LIQUID DEPTH
Roger Fell, Baildon, England, assignor to Scan Group Limited, West Yorkshire, England
Filed Nov. 28, 1989, Ser. No. 441,903
Int. Cl.[5] G01F *23/28;* G06G *7/16*
U.S. Cl. 73—290 V **11 Claims**

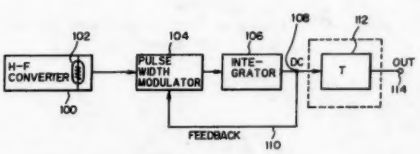
1. An installation for measuring a distance in a body of liquid in which there is defined a reflecting surface, said installation comprising:

means for emitting a divergent beam of radiant energy pulses and for receiving reflections of said pulses, said means being arranged in relation to the body of liquid such that said emitted pulses travel upwardly through the liquid so as to be reflected from said reflecting surface and said reflections of said pulses are constituted by said emitted pulses reflected from said reflecting surface; and



microprocessor means for averaging the time taken for the pulses to travel from the means for emitting to the reflecting surface and back to the means for emitting so as to provide an accurate reading of the distance, said microprocessor means being coupled to said means for emitting and receiving.

5,065,625
HUMIDITY METER
Shiro Nakagawa; Taisuke Domon; Takehiro Imai, all of Chiba, and Atsuko Tsuchida, Saitama, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed May 2, 1990, Ser. No. 517,937
Claims priority, application Japan, May 12, 1989, 1-54782; May 15, 1989, 1-120925; May 15, 1989, 1-120926; Oct. 9, 1989, 1-263703; Oct. 11, 1989, 1-264654
Int. Cl.[5] G01W *1/00*
U.S. Cl. 73—336.5 **17 Claims**



1. A humidity meter comprising;

a humidity sensor (**102**) which provides impedance depending upon humidity to be measured,

a humidity-frequency converter (**100**) for providing an alternate signal of frequency which depends upon the impedance of said humidity sensor (**102**),

a pulse width modulator (**104**) coupled with output of said humidity-frequency converter (**100**) for controlling pulse width of said alternate signal,

an integrator (**106**) coupled with output of said pulse width modulator (**104**) for providing potential proportional to frequency and pulse width of output of said pulse width modulator (**104**),

an output terminal (**108**) coupled with output of said integrator (**106**) providing measured humidity,

a feedback path (**110**) for providing potential at said output terminal (**108**) to said pulse width modulator (**104**) for adjusting pulse width of said alternate signal.

5,065,626

PENDULOUS ASSEMBLY FOR USE IN AN ACCELEROMETER

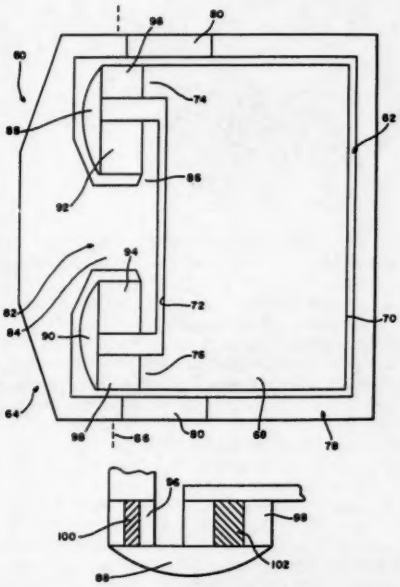
Richard A. Hanson, 21220 NE. 156th St., Woodinville, Wash. 98072

Continuation of Ser. No. 221,116, Jul. 19, 1988, Pat. No. 4,955,233, which is a continuation-in-part of Ser. No. 899,975, Aug. 25, 1986, abandoned. This application May 18, 1990, Ser. No. 525,491

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] G01P *15/08*

U.S. Cl. 73—497 4 Claims



1. A pendulous assembly for use in an accelerometer or other such device including an arrangement for sensing forces acting on the device in a particular direction, said assembly comprising:

(a) a proofmass;

(b) means forming part of said sensing arrangement and carried by or in direct engagement with said proofmass for specifically sensing said forces acting on said proofmass; and

(c) means supporting one end of said proofmass for pivotal movement about a given axis back and forth through a resting plane which contains said proofmass when the proofmass is at rest in the absence of any of said forces, said supporting means including

(i) an isolation bridge support and means for mounting the isolation bridge support to a main support forming part of the force sensing device,

(ii) an arrangement of isolation bridges,

(iii) isolation bridge flexure means connecting said arrangement of isolation bridges with a section of said isolation bridge support for pivotal movement back and forth about said given axis; and

(iv) proofmass flexure means connecting said proofmass with said arrangement of isolation bridges for pivotal movement of said proofmass back and forth about said given axis.

5,065,627

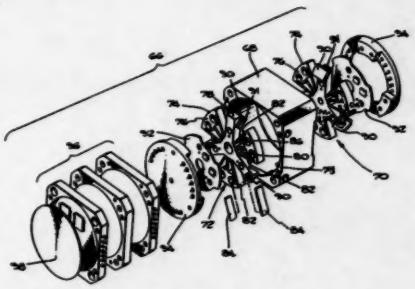
THREE AXIS INERTIAL MEASUREMENT UNIT WITH COUNTERBALANCED, LOW INERTIA MECHANICAL OSCILLATOR

Robert E. Stewart, Woodland Hills, and Samuel N. Fersht, Studio City, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Division of Ser. No. 497,766, Mar. 20, 1990, Pat. No. 5,007,289, which is a continuation of Ser. No. 251,918, Sep. 30, 1988, abandoned. This application Oct. 11, 1990, Ser. No. 595,531

Int. Cl.[5] G01P *9/04*

U.S. Cl. 73—505 5 Claims



1. A three axis inertial measurement unit, comprising:

two platforms counterbalanced against each other mounted as a mechanical oscillator for dithered rotation at a natural frequency of said platforms about a single torsional axis;

a plurality of accelerometers mounted on at least one of said platforms;

each accelerometer having at least an input axis;

said plurality of accelerometers mounted upon said at least one platform such that said input axis of each accelerometer is at a predetermined angle to said single torsional axis and said platform;

said platforms each having:

a three legged, Y-shaped mounting member;

a rotor member positioned between the legs of said mounting member;

web members forming said legs of said Y-shaped mounting member to join said rotor member; and

driving webs mounted on each side of said web members for further joining said mounting member to said rotor member;

said accelerometers mounted upon said at least one of said platforms mounted upon said rotor member thereof at said predetermined angle.

5,065,628

INSTRUMENT FOR MEASURING ACCELERATIONS AND PROCESS OF MAKING THE SAME

Wolfgang Benecke, Berlin, Fed. Rep. of Germany, assignor to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.V., Fed. Rep. of Germany

PCT No. PCT/DE88/00740, § 371 Date Jun. 4, 1990, § 102(e) Date Jun. 4, 1990, PCT Pub. No. WO89/05459, PCT Pub. Date Jun. 15, 1989

Continuation of Ser. No. 99,945, Sep. 23, 1987, abandoned. This PCT application Dec. 1, 1988, Ser. No. 477,964

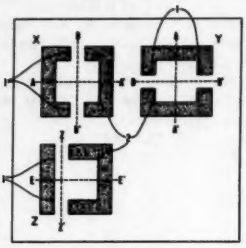
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3741036

Int. Cl.[5] G01P *15/08;* H01L *21/306;* B44C *1/22*

U.S. Cl. 73—517 R 12 Claims

1. An instrument for measuring accelerations, comprising a reset element, a mechano-electric converter, and three micromechanical sensors, each consisting of an inert mass and

sensitive to a motion in one direction to define multiple directions of sensitivity, integrated in a crystal surface layer,



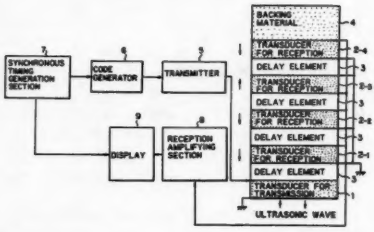
wherein the multiple directions of sensitivity of the sensors point in different directions and do not lie in one plane.

5,065,629

ULTRASONIC INSECTION APPARATUS

Mitsuhiro Koike, and Shusou Wadaka, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1990, Ser. No. 595,610
Claims priority, application Japan, Oct. 25, 1989, 1-277863
Int. Cl.[5] G01N *29/22*; G06F *15/336*
U.S. Cl. 73—602 **5 Claims**



1. An ultransonic inspecting apparatus characterized by comprising:

a sequence generating means for generating a finite sequence with a lenght N which is composed of binary values and has a sharp autocorrelation function, the sequence generating means generating the finite sequence by changing between the binary values per each unit time T;

a transmission signal generating means for generating a transmission signal corresponding to the sequence;

a transmitting means for transmitting ultrasonic waves to an object by means of said transmission signal;

a receiving means for receiving an echo corresponding to said transmission signal, the receiving means having N number of transducers each of which is placed over the other so that each ultrasonic propagation time between them is identical to the unit time T and a series of polarities of outputs of the transducers correspond to a series of binary values which is obtained by reversing the time order of the binary values of the sequence; and

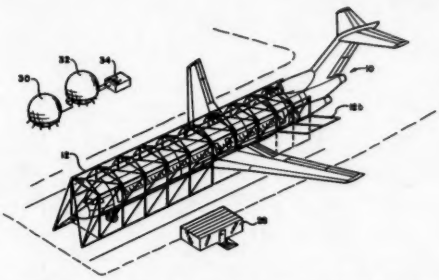
a means for generating the sum of the outputs of the transducers.

5,065,630

INTEGRATED SYSTEM FOR AIRCRAFT CRACK DETECTION

Richard N. Hadcock, Huntington; Richard R. Chipman, Centerport; Michael Horn, South Setauket, and Richard F. Chance, Bayport, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 12, 1990, Ser. No. 536,808
Int. Cl.[5] G01M *5/00*
U.S. Cl. 73—802 **22 Claims**



10. A system for detecting cracks in a completed aircraft on the ground wherein the aircraft has a fuselage and a wing comprising:

a) a framework disposed about the fuselage and extending over a majority of the length of the fuselage;

b) support means supporting a plurality of sensors in operative position with respect to a surface of the aircraft to be tested, the sensors having means to generate a signal upon detecting a crack in the aircraft, the support means comprising:

i) at least one mounting beams;

ii) mounting means to mount the plurality of sensors on the at least on mounting beam; and,

iii) attaching means to attach the at least one mounting beam to a surface of the wing;

c) means for applying loads to the aircraft simulating the loads encountered by the aircraft during flight comprising at least one first inflatable bag member located beneath the wing such that, when the at least one bag member is inflated it contacts a lower surface of the wing to exert upward loads thereon;

d) at least one second inflatable bag member located between the support framework and an upper portion of the fuselage such that, when the at least one second bag member is inflated, it exerts downward loads on the fuselage; and,

e) means to analyze the signals generated by the sensors during the application of the loads to detect any crack in the aircraft.

5,065,631

GAUGE FOR MEASURING BENDING OF STRUCTURES

William G. Ashpitel, Weybridge, and Ralph G. W. Parsons, Staines, both of England, assignors to The British Petroleum Company, p.l.c., London, England

Filed Dec. 8, 1988, Ser. No. 281,571
Claims priority, application United Kingdom, Dec. 12, 1987, 8729061
Int. Cl.[5] G01N *3/20*
U.S. Cl. 73—849 **16 Claims**

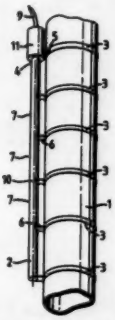
1. A gauge suitable for measuring bending of a structure in which the gauge comprises in combination:

(a) a bending bar having a longitudinal axis,

(b) means for measuring bending of said bar, and

(c) attaching means capable of attaching said bending bar to

said structure so as to allow said bar to bend in conformity to the bending in any direction of said structure, said attaching means comprising clamps having mountings



which in use, allow at least part of said bar to move longitudinally along its axis with respect to said structure, whereby measurement of bending of said bar enables bending of said structure to be determined.

5,065,632

FLOW LINE WEIGHING DEVICE

Peter A. Reuter, 38 Honeysuckle Dr., Hope Valley, South Australia, Australia

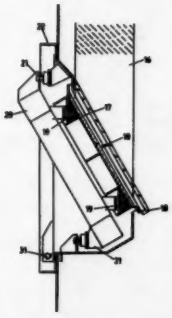
PCT No. PCT/AU88/00288, § 371 Date Jan. 23, 1990, § 102(e) Date Jan. 23, 1990, PCT Pub. No. WO89/01133, PCT Pub. Date Feb. 9, 1989

PCT Filed Aug. 4, 1988, Ser. No. 458,663

Claims priority, application Australia, Aug. 4, 1987, PI3518

Int. Cl.[5] G01F *1/30*

U.S. Cl. 73—861.73 7 Claims



1. A flow line weighing device for weighing flowable material, the device comprising a non-horizontal plate having a front surface against which the flowable material impinges, characterized in that the plate is supported solely by a plurality of force transducers attached to and in direct contact with the rear surface of the plate, and an electronic circuit to process signals from said force transducers developed by the horizontal component of the impinging force to provide a read-out independent of the area of the front surface of the plate which is impinged by the fluent material being weighed.

5,065,633

APPARATUS FOR THE MEASUREMENT OF DRIVE TORQUES

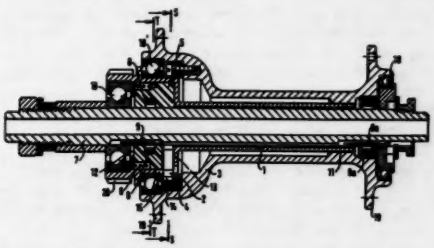
Jean-Pierre Mercat, Chateau-Renault, France, assignor to Look, S.A., Nevers, France

Filed Apr. 11, 1990, Ser. No. 507,935

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3912883

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.34 16 Claims



1. Apparatus for the measurement of the drive torque exerted on a drivable wheel, in particular on the drive wheel of a bicycle, and/or of parameters associated with the drive torque, the apparatus comprising a wheel hub (3) which is rotatably journalled relative to a fixed axle (7); a drive axle (1) which is coaxially disposed between the fixed axle (7) and the wheel hub (3); a member (18') which permits a relative rotation disposed between the drive axle (1) and the wheel hub (3) at the drive side end; a fixed connection (11) formed at the other end between the drive axle (1) and the wheel hub (3); a device for detecting the relative rotation between the wheel hub (3) and the drive axle (1) which depends on the drive torque and also for generating signals representative of the relative rotation and suitable for evaluation, characterized in that a carrier element (5) for at least one measurement transducer (8) is provided in a guide space (12) between the fixed axle (7) and the drive axle (1) and is pivotable about the fixed axle (7); in that at least one sensor (9) which detects the pivoting of the carrier element (5) is associated with the measurement transducer (8); and in that the pivot angle of the carrier element (5) is controlled by a mechanical multiplier member (4) which acts between the wheel hub (3) and the drive axle (1) and is actuated by their relative rotation.

5,065,634

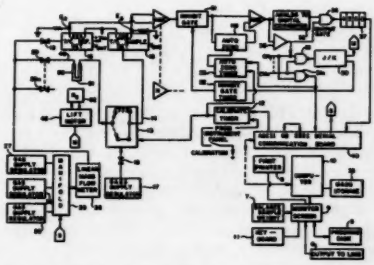
METHOD AND APPARATUS FOR THE AUTOMATIC DETERMINATION OF SURFACE AREA

Howard Jennings, 42 Pinetree La., Roslyn Heights, N.Y. 11577

Filed Sep. 10, 1990, Ser. No. 580,142

Int. Cl.[5] G01N *15/08*

U.S. Cl. 73—865.5 10 Claims



1. In a method for determining the surface area of a material with a surface area analyzer which uses the dynamic flow

method by continuously passing a stream of a gaseous mixture of known and constant composition consisting of an adsorbate nitrogen, and an inert gaseous diluent helium in contact at a constant pressure with a measured sample of the material on a once-through basis at a temperature at which neither the inert diluent nor the adsorbate is appreciably adsorbed by the sample, then while continuing said stream, cooling the sample to a temperature at which adsorption of the adsorbate by the sample selectively takes place by immersing the sample in a liquid bath, using a detector sensing means in a bridge configuration to continuously measure the decrease in the concentration of the adsorbate in the stream down stream of the sample, during the cooling and until equilibrium is re-established integrating the sensed signal from the sensing means using an integrating means to provide a signal that is proportional to the volume of gas adsorbed by the sample of the material and using the detector sensing means, sensing the decrease in concentration of the adsorbate over the period of cooling until equilibrium is re-established, the improvement comprising the steps of:

inhibiting by means of a gate all signals emanating from the detector sensing means immediately after the sample is cooled to its adsorption temperature, to eliminate false or phantom signals generated in the detector sensing means caused by the chilling of the gas mixture;

deactivating the inhibit gate to reconnect the detector sensing means to said integrating means, so that the return to equilibrium which signals the completion of absorption, can be detected;

removing the liquid nitrogen bath from the sample of material in response to the absorption completion signal to cause the sample of material to warm to ambient temperature, to permit desorption of the adsorbed nitrogen in the sample of material;

detecting the desorbed nitrogen from the sample of material using the detector sensing means to generate a signal proportional to the volume of nitrogen adsorbed by the sample of material; and

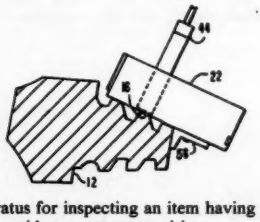
integrating the desorption signal from said sensing means using the integrating means to provide a measure of the surface area of the sample of material.

5,065,635

APPARATUS AND METHOD FOR INSPECTING AN ITEM HAVING GROOVES MACHINED THEREIN

Lee W. Burtner, Elizabeth Township, Allegheny County, and David A. Chizmar, Washington Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 14, 1990, Ser. No. 583,060
Int. Cl.[5] G01R *33/00*
U.S. Cl. 73—866.5 **9 Claims**



1. An apparatus for inspecting an item having grooves machined therein, said apparatus comprising:

a main housing having longitudinal grooves formed in opposite sides thereof, said main housing defining an underside for contacting the item to be inspected;

a carriage having opposite sides adapted for slidably engaging said longitudinal grooves in said main housing;

sensor means for inspecting the item;

means for connecting said sensor means to said carriage such that said sensor means extends beyond said underside of said main housing, said means for connecting being adjustable for controlling the degree of extension; and

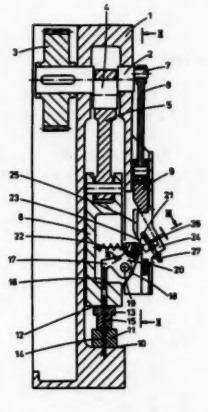
reference member means adjustably connected to and extending from said underside of said main housing for enabling uniform and consistent contact of said sensor means with the item to be inspected.

5,065,636

DRIVE ARRANGEMENT FOR A MALE-DIE-SIDE EJECTOR SLIDABLY DISPOSED IN A SLIDE OF A MECHANICAL METAL-FORMING PRESS

Günter Riedisser, Eisslingen, and Rainer Braun, Göppingen, both of Fed. Rep. of Germany, assignors to L. Schuler Pressen GmbH, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 478,457
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1989, 3904278
Int. Cl.[5] B21J *13/14;* **B30B** *15/00*
U.S. Cl. 74—40 **6 Claims**



1. A drive arrangement for a male-die-side ejector slidably disposed in a slide of a mechanical metal-forming press comprising:

an angle lever pivotably disposed on the slide, one leg of which acts upon an end of the ejector facing away from the male die and another leg of which is acted upon by a control cam;

means for driving the control cam in a timed manner;

means for holding the control cam in contact with the other leg of the angle lever;

a control carriage attached to the control cam, the control carriage being slid in a guide fixed at a stationary frame positioned substantially parallel to a moving direction of the slide which also moves relative to the frame; and

a control connecting rod attached at one end to the control carriage at a bearing, and at another end, being disposed eccentrically on a shaft which drives the slide.

5,065,637

ADJUSTING DEVICE AND ADJUSTABLE TEXTILE FIBER CARDING APPARATUS

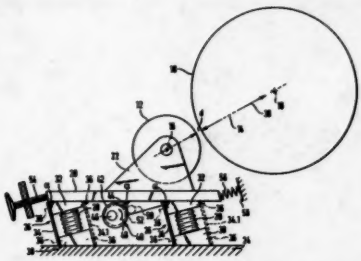
Roland Soltermann; Peter Fritzsche, both of Winterthur, and Kurt Müller, Schlieren, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Mar. 7, 1990, Ser. No. 489,530

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907517; Dec. 5, 1989, 3940229

Int. Cl.[5] D01G *15/28, 15/46;* **F16M** *7/00*

U.S. Cl. 74—99 R **27 Claims**



1. An adjusting device for carrying out linear adjusting movements which are at least essentially independent of friction, and free from jerks and oscillations, comprising:

a carrier for an object to be adjusted;

an actuating mechanism in contact with the carrier for reciprocating the carrier along a path in a forward direction whereby the object can be proximally adjusted, and a rearward direction whereby the object can be distally adjusted;

the carrier being supported at at least two positions spaced apart from each other along said path on respective supporting devices, at least one of the supporting devices comprising a generally cylindrically shaped bellows filled with a substantially incompressible medium, the bellows being secured at one end face thereof to the carrier and at another end face thereof to a foundation; and

at least one leaf spring being secured at one end thereof to the foundation and at another end thereof to the carrier, the leaf spring and another one of the supporting devices permitting freedom of movement along said path in a manner substantially free of friction.

5,065,638

VARIABLE RATIO TRANSMISSION

Ivor Barens, 401 Markham St., Toronto, Ontario M6G 2L1, Canada

Continuation-in-part of Ser. No. 524,905, May 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 382,431, Jul. 20, 1989, abandoned. This application Feb. 13, 1991, Ser. No. 654,806

Int. Cl.[5] F16H *3/24*

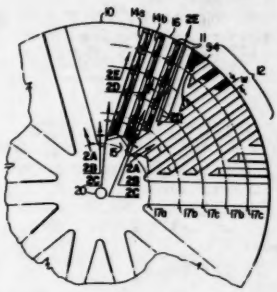
U.S. Cl. 74—351 **10 Claims**

1. A variable ratio transmission comprising:

(a) a pinion having a plurality of pins equally spaced about its periphery, each of said plurality of pins having urging means to urge each said pin to an extended position and being depressible against said urging means to a depressed position;

(b) a face gear comprising a plate rotatable about a centre of rotation and having a surface comprising a plurality of fingerlike crowns extending inwardly from the periphery of said plate forming grooves between adjacent crowns such that at intermittent radii from said centre of rotation, for any one of said grooves, there is another one of said grooves such that the arc distance between said one and said other of said grooves is approximately equal to the arc distance between adjacent pins of said pinion, said grooves having a width greater than the width of the portion of said pins entering said grooves, and such that at least some of said one and said other of said grooves are not adjacent grooves;

(c) means mounting said pinion for rotation on said face gear and permitting said pinion to be translated radially along said face gear;



whereby said plurality of pins of said pinion, when in said extended position, may mesh with said grooves of said face gear so that when said pinion is positioned at one of said intermittent radii and said face gear and pinion rotate, said plurality of pins mesh with ones of said grooves and such that, when said pinion is positioned at other than one of said intermittent radii, any of said plurality of pins which do not mesh with said grooves may be depressed by a crown toward said depressed position to permit continued rotation of said pinion and face gear without jamming.

5,065,639

DOUBLE BEVEL GEAR ANGULAR DRIVE

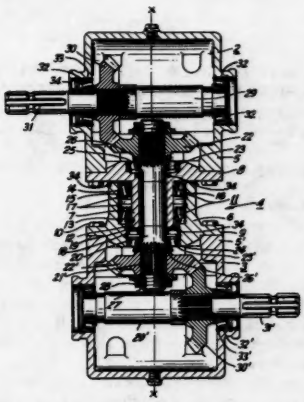
Michael Flanhardt; Andreas Roth, both of Köln, and Clemens Nienhaus, Lohmar, all of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Nov. 19, 1990, Ser. No. 615,222

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938967

Int. Cl.[5] F16H *1/14;* **B25B** *17/00*

U.S. Cl. 74—417 **6 Claims**



1. An assembly, comprising:

two bevel gear angular drives each having a housing;

two spaced bevel roller bearings;

a pivot bearing pivotably connecting the two bevel gear angular drives to the two spaced roller bearings;

a joint shaft extending centrally through the pivot bearing, each of the two bevel gear angular drives having a bevel gear secured on the joint shaft, the pivot bearing including two coaxial sleeves having formed-on flanges secured to the housings of the bevel gear angular drives, the two bevel roller bearings (11) being arranged between the sleeves, and being tensioned relative to each other at the coaxial sleeves (6, 7); and

additional bevel roller bearings (23, 23') arranged so as to support the joint shaft (20) provided with the two bevel gears (22, 22') in the two sleeves (6, 7).

5,065,640

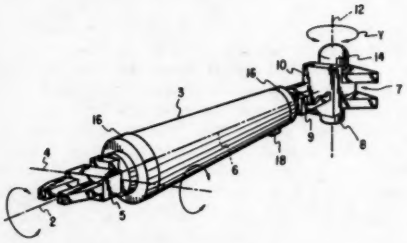
INFLATABLE STRUCTURE

Yoram Koren, Ann Arbor, Mich., and Yechiel Weinstein, Misgav, Israel, assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jul. 9, 1990, Ser. No. 549,963

Int. Cl.[5] G05G *1/00, 11/00*

U.S. Cl. 74—469 **15 Claims**



10. An inflatable structure comprising:

an elongated link formed of a flexible fluidtight material and defining at least one fluidtight chamber, the material of the link having sufficient strength to remain fluidtight when the at least one chamber is inflated with a fluid to a pressure sufficient to rigidize the link due to the fluid pressure in the at least one chamber thereof;

a base;

pivoting means for pivotally mounting the elongated link at the base;

drive means, positioned at the base, for pivotally driving the link to control a position of the link relative to the base when the link is inflated.

5,065,641

SHIFT LEVER ARRANGEMENT FOR OPERATING AUTOMATIC POWER TRANSMISSION

Yoshimi Yamamoto, and Keisuke Kino, both of Shizuoka, Japan, assignors to Fuji Kiko Company, Limited, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 500,872

Claims priority, application Japan, Mar. 30, 1989, 1-37180[U]

Int. Cl.[5] B60K *29/02*

U.S. Cl. 74—473 SW **9 Claims**

1. A shift lever arrangement for operating an automatic power transmission for an automotive vehicle having a brake capable of being actuated, said arrangement comprising:

a control tube arranged essentially parallel to a vehicular steering column and supported thereon so as to be rotatable around a longitudinal axis thereof;

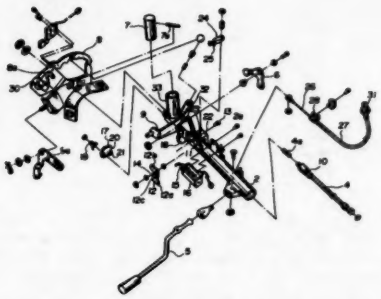
a manually operable lever for causing said control tube to rotate via manual operation;

a shift lever selectively positioned in anyone of a parking range position or other positions, rotating with said control tube for operating the automatic power transmission;

a compression rod received in said control tube, said compression rod being movable in a direction along the longitudinal axis of said control tube between first and second positions by operating said manually operable lever;

first means for preventing said control tube from rotating when said compression rod is positioned in said first position, and for allowing said control tube to rotate when said compression rod is positioned in said second position;

second means, movable between an engaging position in which said second means engages said compression rod and a disengaging position in which said second means disengages from said compression rod, for preventing said compression rod from being positioned in said second position so as to prevent said control tube from rotating when said second means is positioned in the engaging position, and for allowing said compression rod to be



positioned in said second position so as to allow said control tube to rotate when said second means is positioned in the disengaging position; and

electromagnetic driving means for driving said second means in response to turning ON thereof, said electromagnetic driving means causing said second means to be positioned in said engaging position when the electromagnetic driving means is OFF, while said shift lever is positioned in said parking range position, and to be positioned in said disengaging position either when the electromagnetic driving means is turned ON, while said shift lever is positioned in said parking range position, or when said shift lever is positioned in positions other than said parking position.

5,065,642

APPARATUS FOR ABSORBING TORQUE VARIATION

Junji Kagiyama, Kariya; Kiyonori Kobayashi, Chiryu; Mototaka Nakane, Toyota; Masakazu Kamiya, Toyoake; Mitsuhiro Umeyama, Toyota; Masaki Inui, Toyota; Kaoru Wakahara, Toyota, and Masaki Hosono, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha Kariya and Toyota Jidosha Kabushiki Kaisha, Toyoto, both of Kariya, Japan

Filed Feb. 27, 1990, Ser. No. 485,558

Claims priority, application Japan, Feb. 28, 1989, 1-23279[U]; Oct. 19, 1989, 1-122637[U]

Int. Cl.[5] F16F *15/12*

U.S. Cl. 74—574 **23 Claims**

13. An apparatus for absorbing torque vibration comprising:

a first inertial body comprising a first flywheel adapted to be connected to a driving source,

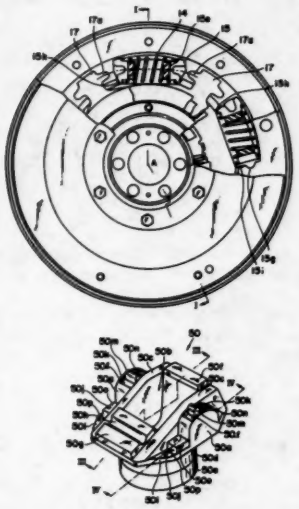
a second inertial body comprising a second flywheel disposed coaxial with the first flywheel, and

a damper mechanism, torque limiting mechanism and hysteresis mechanism interposed between said first and second flywheels,

rotation of said driving source being transmitted between both the flywheels via said damper mechanism, said torque limiting mechanism and said hysteresis mechanism,

wherein the improvement comprises resilient members secured to spring seats engaged with both ends of a spring of

said damper mechanism, at least one of the resilient members being embedded within one of said end faces of the



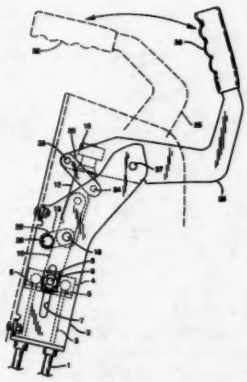
spring seats so as to project from said face thereof directed to abut to one of the first inertial body and the second inertial body so as to project out of the spring seat.

5,065,643

COMPOUND PULL CABLE OPERATING LEVER

Lloyd L. Axtell, Portland, Oreg., assignor to Hyster Company, Portland, Oreg.

Filed Mar. 13, 1991, Ser. No. 668,960
Int. Cl.[5] F16C *1/12*
U.S. Cl. 74—501.6 **4 Claims**



1. An overcenter toggle type pull cable operating lever comprising:

a) a frame;

b) a cable slide for connection to a pull cable and arranged for displacement within the frame along the axis of the pull cable;

c) an adjuster link pivotally connected to the cable slide and pivotally connected to;

d) an intermediate lever arranged within the frame to rotate about a pivot when acted upon by;

e) an intermediate link pivotally connected to the intermediate lever and pivotally connected to;

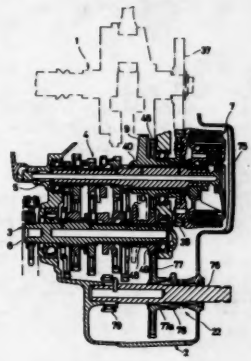
f) a hand lever arranged within the frame for rotation about a pivot.

5,065,644

COUNTERBALANCE MECHANISM FOR INTERNAL COMBUSTION ENGINE

Toshio Shimada, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 376,082
Claims priority, application Japan, Jul. 6, 1988, 63-169390
Int. Cl.[5] F16C *3/04*; F02B *75/06*
U.S. Cl. 74—603 **10 Claims**



1. A counterbalance mechanism in an internal combustion engine having a crankshaft, a clutch, and a transmission including a main shaft rotatable by the crankshaft through the clutch and a countershaft rotatable by the main shaft through gears, said counterbalance mechanism comprising:

at least a primary counterweight rotatable in synchronism with the crankshaft;

a hollow shaft rotatably supported concentrically on the main shaft,

said primary counterweight being integrally formed with said hollow shaft; and

said clutch being co-rotatably mounted on said hollow shaft and operatively coupled to the crankshaft at the same speed as and in the opposite direction to the crankshaft.

5,065,645

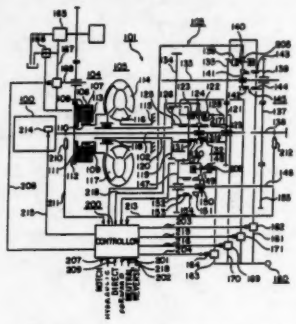
POWER TRANSMISSION DEVICE

Kazuhiko Nagase, Kanazawa, and Hideki Nakamura, Fukiagemachi, both of Japan, assignors to Niigata Converter Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1990, Ser. No. 558,102
Int. Cl.[5] F16H *47/08*
U.S. Cl. 74—859 **3 Claims**

1. A power transmission device suitable for use in a rail car and so providing coasting operation and the same speed ratios and the same speed change steps in both forward and rearward powered operations, wherein the output of an engine is selectively transmitted to a transmission either indirectly through a torque converter or directly by bypassing said torque converter, the output being then transmitted to an output shaft through said transmission with the rotational speed being varied, characterized in that the input shaft connected to the output shaft of said engine can be selectively connected to a low-speed drive gear or a high-speed drive gear of said transmission through a low-speed clutch or a high-speed clutch,

respectively, each comprising a mechanically engaging clutch, and in that a cylindrical shaft secured to said low-seed drive gear is arranged coaxially with said input shaft, said cylindrical



shaft being connected to an output side of said torque converter through a free wheel, and in that an impeller wheel at the input side of said torque converter can be connected to said input shaft through a hydraulic friction clutch.

5,065,646

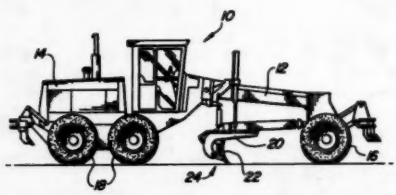
PROCESS FOR FABRICATING A MOLDBOARD BLADE

Leroy Rudolph, Jr., and Dennis A. Brimeyer, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 24, 1990, Ser. No. 557,886

Int. Cl.[5] B21K *19/00*

U.S. Cl. 76—101.1 **14 Claims**



1. A process of fabricating a earthmoving blade having a working surface and a support structure surface, the process comprising the following steps:

bowing the blade towards its support structure surface;

welding a support structure to the bowed blade;

bending the blade and the mounted support structure towards the working surface of the blade;

releasing the blade;

comparing the blade with a final desired shape for the blade; and

bending the blade again as necessary to achieve the final desired shape.

5,065,647

BIT FOR DRILLING CAST IRON

Jonathon S. Johnson, Brighton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 27, 1990, Ser. No. 572,646

Int. Cl.[5] B23B *51/02;* **B23P** *15/32*

U.S. Cl. 76—108.6 **7 Claims**

1. A method of adapting a fluted drill bit for more effective drilling of cast iron workpieces, comprising:

(a) providing, across the pointed end of said fluted drill bit, a diametrically extending slot;

(b) forming a blade of a matrix phase of cemented carbide particles which are hot pressed at a temperature of about 2500° F. and at a pressure in the range of 800,000–1,000,000 psi, said blade being effective to snugly fit within the contours of said slot, said blade being comprised of cemented carbide powder within which is diffusion bonded a pair of insert phases constituted of cubic boron nitride, said insert phases being located at opposite

outside corners of said blade and extending radially inwardly no greater than the cutting zone of said pointed end of the fluted drill bit; and

(c) after seating said blade within said slot, fixedly securing the carbide surfaces of said blade exposed to the walls of said slot.

5,065,648

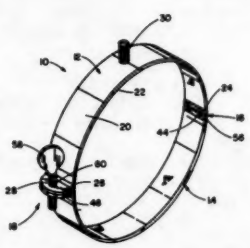
OIL FILTER WRENCH

Gerald E. Hoefbaum, Jr., 872 Union Rd., Xenia, Ohio 45385-7212

Filed Dec. 7, 1990, Ser. No. 623,562

Int. Cl.[5] B25B *13/50*

U.S. Cl. 81—64 **8 Claims**



1. A wrench for manipulating an oil filter comprising:

A) a circular body which includes

(1) a semi-circular, semi-rigid top section having

(a) an inner surface,

(b) an outer surface,

(c) a hinge element at one end,

(d) a fastening projection at another end, said projection extending radially outward from said outer surface and having a bore defined therethrough,

(e) a threaded fastener mounted on said outer surface to extend radially outward from said outer surface and being positioned midway between said hinge element and said projection, and

(f) a plurality of shark tooth-shaped projections mounted on said inner surface and extending radially inward of said top section, said shark tooth-shaped projections being spaced apart from each other angularly about said top section to have approximately 45° between adjacent shark tooth-shaped projections;

(2) a semi-circular, semi-rigid bottom section having

(a) an inner surface,

(b) an outer surface,

(c) a hinge element at one end of said bottom section and located adjacent to said top section hinge element,

(d) a fastening projection at another end, said projection extending radially outward from said outer surface

and having a bore defined therethrough and being located adjacent to said top section fastening projection, said fastening projection bores being positioned to be aligned with each other when said top and bottom section projections are in abutting contact with each other,

(e) a plurality of shark tooth-shaped projections mounted on said bottom section inner surface and extending radially inward of said bottom section, said shark tooth-shaped projections being spaced apart from each other angularly about said bottom section to have approximately 45° between adjacent shark tooth-shaped projections on said bottom section, said bottom section shark tooth-shaped projections being diametrically opposed to corresponding top section shark tooth-shaped projections when said bottom section is closed with said top section; and

B) connecting means for connecting said top section to said bottom section, said connecting means including

(1) hinge connecting means pivotally connecting said top section hinge element to said bottom section hinge element,

(2) a screw thread defined in said top section fastening projection adjacent to said top section fastening projection bore,

(3) a screw thread defined in said bottom section fastening projection adjacent to said bottom section fastening projection bore, and

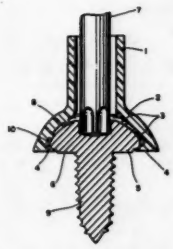
(4) a threaded wing nut for threadably coupling said top section projection to said bottom section projection via said top section screw thread and said bottom section screw thread.

5,065,649

DEVICE FOR HOLDING FASTENERS

David E. Evers, Leawood, Kans., and Charles A. Milburn, Kansas City, Mo., assignors to Bulter Manufacturing Company, Grandview, Mo.

Filed Aug. 21, 1990, Ser. No. 570,524
Int. Cl.[5] B25B *23/08*
U.S. Cl. 81—458 **1 Claim**



1. A device for holding a fastener by its head, comprising

a tubular member having at one end a pliable dome-shaped enlargement, said enlargement having an interior surface and terminating at a bottom end surface,

an annular, internally projecting lip, adjacent said end surface, said lip having an oblique upper surface for engaging the fastener head along its bottom outer edge, and

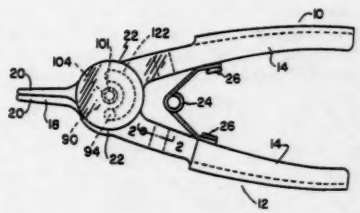
at least one annular rib projecting obliquely downward from the interior surface of the enlargement, intermediate said tubular member and said internal lip, for engaging an upper surface of the fastener head, and thereby gripping the head between the annular rib and the upper surface of the internal lip.

5,065,650

HAND TOOL

J. Edward C. Anderson, Moreland Hills, and James R. Jeromson, Jr., Aurora, both of Ohio, assignors to Milbar Corporation, Chagrin Falls, Ohio

Division of Ser. No. 378,448, Jul. 10, 1989, Pat. No. 5,007,313, which is a continuation of Ser. No. 182,016, Apr. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 46,851, May 7, 1987, abandoned. This application Mar. 26, 1991, Ser. No. 675,312
Int. Cl.[5] B23P *19/04*
U.S. Cl. 81—486 **7 Claims**



3. A reversible plier tool for installing or removing internal or external retaining rings or the like comprising:

a) a pair of lever sections each having a handle portion, and a boss portion situated intermediate the handle portion and the jaw portion;

b) a driving knob;

c) a driving structure including a pivot connection and a driving connection, the driving connection interconnects the lever sections and the driving knob, the pivot connection interconnects the knob and one of said levers, the connections permitting movement of the lever sections between a first working position in a crossed relationship and a second working position in said a side by side relationship and return; and

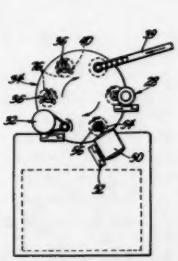
d) a groove in one of said lever sections for engagement with the driving connection in a work position establishing relationship, whereby movement of the tool between positions is provided by rotation of the driving knob which moves the driving connection along the groove.

5,065,651

METHOD AND MACHINE FOR FINISHING COMMUTATORS

Louis F. R. Amey, Winchester, Mass., assignor to McCord Winn Textron Inc., Winchester, Mass.

Filed Jun. 30, 1989, Ser. No. 374,186
Int. Cl.[5] B23C *3/00*; B24B *7/04*
U.S. Cl. 82—1.11 **3 Claims**



1. A process for finishing the full radial surface of a radial face type commutator having a longitudinal axis and further having a plurality of conductor segments each including a radially inwardly located edge and a radially outer edge joined

by radial edges forming slots between each of the conductor segments comprising the steps of:

rotating the commutator on its longitudinal axis;

providing a cutter tool with a plurality of cimferentially spaced cutting inserts thereon each having a tip portion located on the outer radius of said cutter tool for cutting material;

rotating the commutator along its longitudinal axis while simultaneously rotating said cutter tool with respect to said rotating commutator to cause said tip portions to remove metal from said conductor segments;

removing a predetermined thickness of material from the face of each of said conductor segments while simultaneously moving the tool tips along a slightly curved substantially radial path which directs said tip portion along the radial edges of the conductor segments for finishing the radial edges of the conductor segments as burr free surfaces.

5,065,652

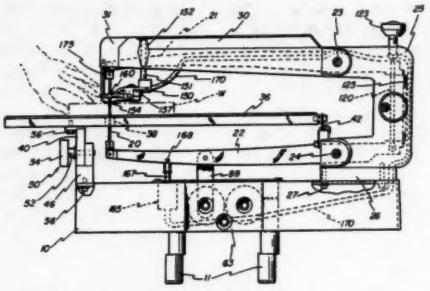
SCROLL SAW

John G. Legler, Huber Heights; Robert L. Bartlett, Dayton, and David D. Flora, Arcanum, all of Ohio, assignors to Shopsmith, Inc., Dayton, Ohio

Division of Ser. No. 471,015, Jan. 22, 1990, abandoned, which is a continuation of Ser. No. 226,172, Jul. 29, 1988, abandoned. This application Dec. 11, 1990, Ser. No. 625,508

Int. Cl.[5] B23D *41/00*

U.S. Cl. 83—168 **8 Claims**



1. A reciprocating saw comprising:

(a) frame means including a base and an upper portion overhanging said base;

(b) upper and lower arm members extending above and below said frame means and mounted on said frame means for oscillating movement with respect to said base,

(c) drive means for causing oscillating movement of said arm members,

(d) a saw blade attached to said arm members for oscillating movement therewith,

(e) air pump means mounted on said frame means,

(f) guard means for said saw blade mounted on said frame means,

(g) said guard means including a guard tube of non-flexible material supported on said frame means forward of said saw blade and extending substantially the full length of the portion of said saw blade above said base,

(h) said guard tube having an open end positioned above and directed toward said base,

(i) tubing connecting an opposite end of said guard tube to an output side of said pump means, and

(j) means operated by said drive means for causing said pump means to deliver a stream of air to said tubing for discharge from said open end of said guard tube.

5,065,653

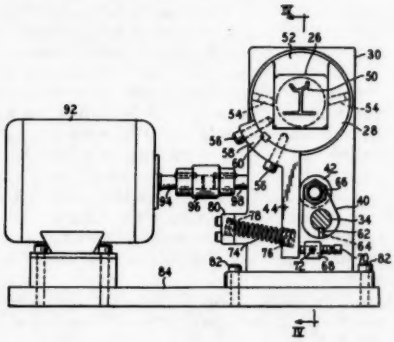
TWIST-SHEARING APPARATUS

John A. Werner, Milwaukee, Wis., assignor to Toolrite Manufacturing Company, New Berlin, Wis.

Filed Aug. 23, 1990, Ser. No. 571,216

Int. Cl.[5] B23D *23/04*

U.S. Cl. 83—199 **18 Claims**



1. A rotary cut-off apparatus for shearing extruded stock using first and second shearing dies, comprising:

means for moving extruded stock into the rotary cut-off apparatus at a predetermined rate;

means for holding a first shearing die stationary in a position to accept the extruded stock;

means for holding a second shearing die abutting said first shearing die and in registration with said first shearing die when in a first position, said means for holding said second shearing die being rotatable about a die axis of rotation relative to said means for holding said first shearing die;

means for rotating said second shearing die from said first position relative to said first shearing die through a limited angle of rotation about said die axis of rotation to shear the extruded stock that extends through said first and second shearing dies into pieces of predetermined lengths, said means for rotating including:

a die lever connected to said means for holding said second shearing die and extending generally radially therefrom relative to said die axis of rotation,

a cam mounted for rotation on a cam axis of rotation, said cam axis of rotation being generally parallel to said die axis of rotation, said cam having an eccentric movable against said die lever upon rotation of said cam about said cam axis of rotation to bear against said die lever and cause said die lever to rotate said means for holding said second shearing die relative to said means for holding said first shearing die, said limited angle of rotation resulting from a radial extent of said eccentric of said cam, and

means for rotating said cam about said cam axis of rotation.

5,065,654

MACHINE FOR PUNCHING AND SHEARING ANGLE IRON AND FLAT STOCK

Louis G. Cowan, Cherry Valley, and Dale L. Cardey, Loves Park, both of Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

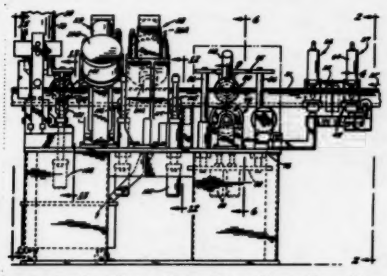
Filed Oct. 9, 1990, Ser. No. 594,858

Int. Cl.[5] B26D *9/00, 7/02, 7/06*

U.S. Cl. 83—255 **18 Claims**

1. A machine for punching holes in either an elongated piece of flat stock or an elongated piece of angle stock of substantially V-shaped cross-section, said machine comprising means for supporting said stock for endwise movement along a gener-

ally horizontal path, means for advancing the stock intermittently along said path, a punch press positioned along said path and operable to punch a hole in said stock when the latter dwells, said supporting means comprising in part an upwardly opening V-shaped cradle having first and second inclined sides for supporting said angle stock in a position with the V thereof opening upwardly, said first side of said cradle supporting said flat stock in an inclined position in which one edge of the flat stock engages the second side of the cradle, and a mechanism



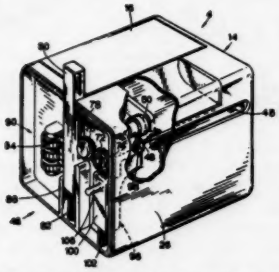
for selectively clamping said stock to said cradle, said mechanism comprising a fluid-operated actuator having a cylinder and having a rod adapted to advance and retract vertically relative to said cylinder, a clamping nose on the lower end of said rod and adapted to engage said stock and clamp said stock against said cradle when said rod is advanced, and means mounting said cylinder for pivoting on said supporting means about an axis located above and extending substantially parallel to said path thereby to enable said nose to tilt as necessary to clamp said stock against said cradle.

5,065,655

PILL STRIP DISPENSER

Terry M. Haber, 25011 Castlewood, El Toro, Calif. 92630

Filed Mar. 9, 1990, Ser. No. 491,672
Int. Cl.[5] B26D *1/56*; B26F *1/00*
U.S. Cl. 83—322 **30 Claims**



1. A pill strip dispenser assembly comprising:

a pill strip including a pill strip package having longitudinal edges and defining a plurality of longitudinally arranged packets, each packet including a pocket with medicine therein, the packets separated by laterally extending separation lines; and

a pill strip dispenser including:

a housing defining a supply region and a dispensing path along which the pill strip moves from the supply region to a discharge position; and

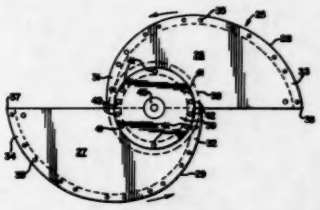
a drive assembly, mounted at least partially within the housing, including a drive element along the dispensing path which engages the pill strip along a drive line and forces the pill strip from the supply region, along the dispensing path and to the discharge position, the drive line intersecting at least a portion of each of the pockets, the drive element weakens the pill strip package along the drive line to form a tear line to aid access to the medicine within the packet.

5,065,656

FOOD SLICING WITH MULTIPLE CUTTING SURFACE BLADE

Dennis G. Flisram, Plainfield, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Sep. 21, 1990, Ser. No. 586,066
Int. Cl.[5] B26D *1/28*
U.S. Cl. 83—356.003 **3 Claims**



1. An apparatus for providing a series of sliced food products from a large stick of meat or other food product, comprising:

means for supporting and feeding a food stick to and into a slicing assembly having a rotary mounted blade assembly which rotates into generally perpendicular severing and slicing engagement with and completely through an end of the food stick;

said blade assembly including a substantially centrally positioned mounting member and first and second blade member, each said blade member having a curved cutting surface having a length adequate to cut completely through a perpendicular cross-section through the food stick, said curved cutting surface includes a leading edge of each curved cutting surface and terminates at a trailing tip of the blade member curved cutting surface, each said blade member lying generally along a same plane, each blade member having a straight edge extending between said leading edge and said trailing tip, wherein a portion of the straight edge of said first blade member is adjacent to a portion of the straight edge of said second member such that the interface between said straight edge portions lies substantially coincident with a line between said trailing tips; and

each said leading edge of the curved cutting surface is spaced from said mounting member by a radial distance that is substantially less than the radial distance by which each said trailing tip is spaced from said mounting member, such that the leading edge of the curved cutting surface of one of said blade members is radially offset from the trailing tip of another of said blade members thereby defining a gap of said blade assembly which imparts a non-slicing mode to the apparatus when said blade assembly is rotating and when said supporting and feeding means is feeding the food stick to and into said slicing assembly, at least two of said gaps being provided, whereby the apparatus has alternating slicing modes and non-slicing modes, each said slicing mode beginning when the curved cutting surface of one of said blade members is in generally perpendicular severing and slicing engagement with the food stick and ending when a slice is completely severed from the food stick, and each said non-slicing mode being when the food stick is within one of said gaps and out of engagement with the rotating blade assembly, and whereby at least two slices of the food stock are severed from the food stock during each rotation of said blade assembly through the end of the food stick.

5,065,657

AUTOMATIC LOCKING MECHANISM FOR THE DRIVE DEVICE OF A MICROTOME

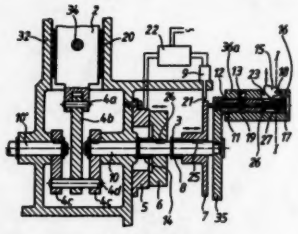
Gerhard Pfeifer, Solms, Fed. Rep. of Germany, assignor to Wild Leitz GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 401,765

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830725

Int. Cl.[5] G01N *1/06*

U.S. Cl. 83—703 18 Claims



1. A microtome comprising:

a drive device for producing a movement between a knife and an object holder;

a first handle having a gripping surface for an operator, for manual actuation of the drive device;

a blocking mechanism for locking the drive device, thereby preventing motion of the handle and the object holder;

switching means associated with the gripping surface of the handle for actuating the blocking mechanism whenever an operator releases his hand from the gripping surface; and

a second handle having a gripping surface for an operator, for manual actuation of the drive device, said second handle being mounted on a side of the microtome opposite the first handle, and the second handle also including switching means associated with its gripping surface for actuating the blocking mechanism whenever an operator releases his hand from its gripping surface, and wherein the gripping surfaces of the first and second handles are detachably connected to the handles, whereby a single gripping surface can be interchangeably used on both of the first and second handles for selective right-hand or left-hand operation.

5,065,658

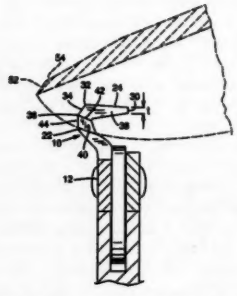
CUTTER LINK

Lynn J. Ziegelmeyer, P.O. Box 1112, Medford, Oreg. 97501

Filed Jun. 22, 1990, Ser. No. 542,096

Int. Cl.[5] B27B *33/14*

U.S. Cl. 83—834 5 Claims



1. In a cutter link for saw chain where the link has a body portion and the body portion has a forward end and a rear end, a depth gauge projecting upwardly from the forward end of the body portion and a cutter joined to and projecting up from the rear end of the body portion, the cutter including a side plate and a top plate joining with the side plate and the top plate having a terminal edge extending the length of the top plate, the improvement comprising:

a top plate that in cross-section has an essentially flat extend adjacent the terminal edge and a given thickness at the terminal edge, the side plate in cross-section having a transition region where it inclines downwardly and outwardly from its joinder with the top plate to reach a zone of maximum lateral extension and the side plate then extending downwardly to join with the body portion, said transition region having a width which is greater than said given thickness,

an essentially planar bevel surface forming the forward edge of the cutter tooth and extending from the zone of maximum lateral extend to said terminal edge and an additional surface joining with said beveled surface forming the forward edge of the cutter tooth in the side plate.

5,065,659

APPARATUS FOR DETECTING THE POSITIONS WHERE STRINGS ARE OPERATED, AND ELECTRONIC MUSICAL INSTRUMENTS PROVIDED THEREWITH

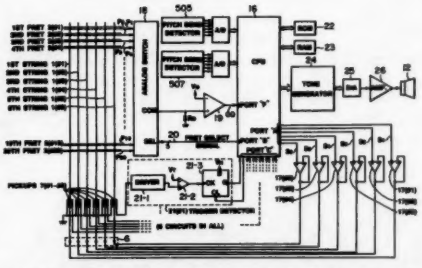
Shigeru Uchiyama, Sayama, and Yoshiyuki Murata, Tachikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 19, 1989, Ser. No. 354,131

Claims priority, application Japan, May 23, 1988, 63-125592; Jun. 17, 1988, 63-149534

Int. Cl.[5] G10H *1/18, 3/18*

U.S. Cl. 84—723 42 Claims



28. An electronic musical instrument including a plurality of electrically conductive frets disposed at predetermined intervals; a plurality of strings stretched at predetermined intervals over said frets so as to cross said frets; string-stopped position detecting means responsive to a stopping operation for any one of said strings for detecting the stopped position of the string; and tone pitch specifying means for specifying the pitch of a tone to be produced in accordance with the stopped position of the string detected by said string-stopped position detecting means,

wherein each of said strings is formed of a two-layer structure of a conductive string member comprising a good electrically conductive material and a resistance member formed on said conductive string member; and

said string-stopped position detecting means comprises voltage supply means for sequentially supplying voltage pulses to said frets while keeping other frets which are not supplied with voltage pulses at ground potential; voltage detecting means for sequentially detecting voltages supplied to said frets by said voltage supply means from said conductive string members of said strings through said resistance members; and detecting means for detecting a stopped position of each of said strings through a combination of a fret supplied with a voltage pulse by said

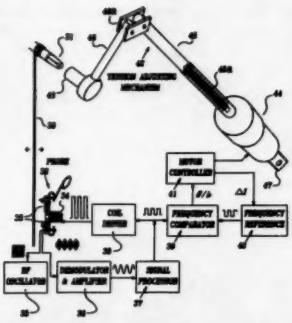
voltage supply means and a string from which a voltage is detected by said voltage detecting means.

5,065,660

PIANO TUNING SYSTEM

Eric de Buda, 55 Humberview Road, Toronto, Ontario, Canada M5S 1W7

Filed May 29, 1990, Ser. No. 530,177
Int. Cl.[5] G10C *3/10*; G10G *7/02*
U.S. Cl. 84—200 11 Claims



1. A system for tuning piano strings, comprising:

means for inducing a controlled vibration in the string at its natural frequency, comprising a sensor for sensing the string vibration, an actuator for transmitting controlled time-varying forces to the string, and a feedback loop comprising a signal processor modifying the phase of the signal from the sensor, feeding the actuator with processed signals from the sensor having the correct phase shift such that the string is caused to vibrate at its natural frequency;

means for sensing the frequency of the vibration;

means for comparing the vibration frequency against a reference frequency representing a desired frequency of vibration for the string;

means for determining the frequency error of the vibration frequency relative to the reference frequency;

control means for determining a motion required to reduce the frequency error; and

means for adjusting string tension responsive to the control means.

5,065,661

HAND HELD ELECTRONIC KEYBOARD INSTRUMENT

Robert G. Hacker, 1024 N. Parkview, Baton Rouge, La. 70815

Filed Nov. 27, 1989, Ser. No. 441,899
Int. Cl.[5] G10H *1/32, 5/00, 3/00*
U.S. Cl. 84—719 13 Claims

1. A keyboard instrument, comprising:

a. a keyboard housing having a top and a bottom, said keyboard housing being of a shape and size such that said housing may be fully supportable by one hand of a user of said instrument;

b. a handle means, attached to and extending from said bottom of said housing, for supporting said housing in a generally horizontally-oriented plane when said handle means is gripped;

c. a keyboard having a plurality of keys operatively attached to said top of said housing;

d. a plurality of keyboard controls, mounted on said keyboard housing, said keyboard controls including a volume control mounted on said handle means so as to be accessible by the hand of the user of said instrument which is gripping said handle means, said volume control including an outwardly biased plunger accessible by the thumb of the user's hand which is gripping said handle means;

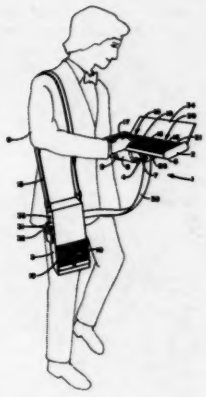
e. a sound component housing;

at least one speaker, mounted within said sound component housing;

g. a synthesizer means, for producing and controlling tones, mounted within said sound component housing;

h. an amplification means, for amplifying tones produced by said synthesizer means, mounted within said sound component housing;

i. keyboard circuitry, mounted within said keyboard housing;



j. sound component circuitry, mounted within said sound component housing;

k. communications circuitry, connecting said keyboard circuitry to said sound component circuitry; and

l. a power supply; and

wherein said keyboard circuitry is operatively connected to said keys, said keyboard controls and said communications circuitry, and said sound component circuitry is operatively connected to said synthesizer means, said amplification mean, said speaker, said power supply and said communications circuitry.

5,065,662

FIRING MECHANISM FOR REVOLVING BATTERY GUN

Stephen J. Bullis, Colchester; Steven R. Duke, Williston; Thomas W. Cozzy, Burlington, and Glenn E. Rossier, Vergennes, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Dec. 24, 1990, Ser. No. 633,723
Int. Cl.[5] F41F *1/10*
U.S. Cl. 89—12 9 Claims

1. A firing mechanism for a Gatling-type gun comprising in combination:

A. a housing;

B. a rotor rotatable with respect to said housing about a longitudinal axis;

C. a plurality of spring-biased firing pins mounted by said rotor in angularly spaced relation, each said firing pin including a cocking lever;

D. an annular safing ring carried by said housing and having an planar cam surface interrupted by a notch coinciding with an angular firing position of said rotor, said cocking levers bearing against said planar cam surface during rotation of said rotor to maintain said firing pins in precocked conditions;

E. a firing cam mounted to said housing for movement between safe and armed positions, said firing cam having

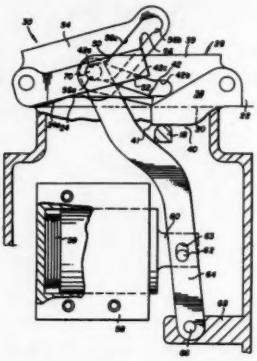
1) a cocking ramp surface terminating at a sear corner longitudinally aligned with said safing ring notch, and
2) a first actuating cam;

F. a safing cam mounted to said housing for movement between safe and armed positions, said safing cam having
1) a bridging cam surface longitudinally aligned with said safing ring notch, and
2) a second actuating cam;

G. an actuator mounted by said housing, said actuator having quiescent and actuated states;

H. an actuating link mounted for movement by said actuator between safe and armed positions and carrying a cam driver in joint engagement with said first and second actuating cams;

I. with said actuator in said quiescent state, said link, said safing cam and said firing cam assume their respective safe



positions with said bridging cam surface spanning said safing ring notch in substantial coplanar relation with said planar cam surface to maintain said cocking levers in said pre-cocked positions during movement past said notch and with said cocking ramp surface disposed in longitudinally displaced relation to said planar cam surface, and with said actuator in its actuated state, said link, said safing cam and said firing cam assume their respective armed positions with said bridging cam surface in longitudinally displaced relation to said safing ring notch and with said cocking ramp surface disposed to successively divert said cocking levers from said planar cam surface and fully cock said firing pins, said cocking levers successively dropping off said sear corner into said safing ring notch, thereby allowing said cocked firing pins to spring longitudinally forward to fire ammunition rounds.

5,065,663

ELECTROPNEUMATIC OR ELECTROHYDRAULIC LINEAR DRIVE MECHANISM

Heinz Stadler; Alfred Heinzl, both of Munich, and Wilhelm Krakowetz, Buchloe, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 623,166

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1989, 3941748

Int. Cl.[5] F15B *13/00*

U.S. Cl. 91—361 **12 Claims**

1. An electromagnetic or electrohydraulic linear drive assembly, comprising:

a carrier member;

a guide element having first and second guide legs;

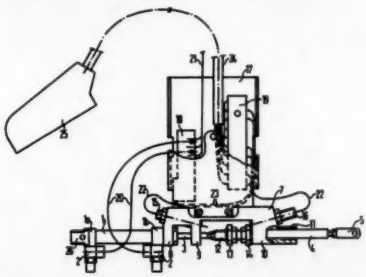
first and second slidably mounted to the guide legs;

first and second stroke-limiting stop elements adjustably mounted to the drive rod such that they are positioned between the two guide legs and can strike against a respective guide leg depending on a direction of reciprocating movement of the drive rod;

a drive cylinder connected to the guide element and having a piston rod connected to one end of the drive rod, said drive cylinder having a first pressurized input at one end and a second pressurized input at the other end such that a piston connected to the piston rod seated in the cylinder is optionally displaceable toward one side or the other dependent on a pressure respectively applied at the respective first or second pressurized input;

a carrier member connecting to the guide element;

a solenoid valve means mounted on the carrier member, said solenoid valve means having a pressurized supply line input and first and second pressurized outputs connecting through respective pressure lines to the respective first and second pressurized inputs of the drive cylinder, said



solenoid valve means controlling the reciprocating movement of the drive rod of the drive cylinder;

first and second position sensor means each formed of a non-contacting proximity switch mounted adjacent the respective guide elements for detecting an approach of the respective first or second stop element toward the respective first or second guide leg;

a connection cable having signal lines for the sensor means and control lines for the solenoid valve, the cable having one end mounted to the carrier member and the other end free and available for connection to a desired-control terminal; and

the assembly forming a one piece unit which can be easily installed by mounting the assembly, connecting the free end of the cable to the control terminal, and connecting a pressure source to the solenoid valve means pressurized input.

5,065,664

CONTROL CIRCUIT FOR A CYLINDER ALLOWING FLOW BETWEEN AN UPPER AND A LOWER CHAMBER

Shuji Ohta, and Toshiyuki Takeuchi, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 30, 1990, Ser. No. 502,340

Claims priority, application Japan, Apr. 3, 1989, 1-84574

Int. Cl.[5] F15B *13/042*

U.S. Cl. 91—420 **20 Claims**

1. A hydraulic control circuit arrangement for a single-acting cylinder having a slidable piston element in a cylinder housing, a first cylinder chamber facing the piston element, a second cylinder chamber separated from the first chamber by the piston element, and a piston rod extending from the piston element to an outer end thereof through the second cylinder chamber, comprising:

a hydraulic power source for supplying an operating oil for operating the single-acting cylinder;

a hydraulic tank for receiving and storing the operating oil;

a directional control valve arranged between the hydraulic power source and the single-acting cylinder for controlling a supply of the operating oil from the hydraulic

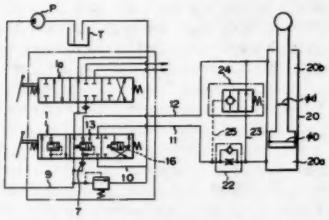
power source to the single-acting cylinder, the directional control valve being shiftable from a neutral position thereof to one of a first position whereat the first cylinder chamber of the single-acting cylinder is connected to the hydraulic power source and a second position whereat the first chamber of the single-acting cylinder is connected to the hydraulic tank;

a first conduit of the operating oil for providing a fluid connection between the fist cylinder chamber of the single-acting cylinder and the directional control valve;

a second conduit of the operating oil for providing a fluid connection between the second cylinder chamber of the single-acting cylinder and the hydraulic tank;

a third conduit of the operating oil for providing a short-circuiting fluid connection between the first and second cylinder chambers of the single-acting cylinder;

a first pilot-operated valve for controlling an evacuation of the operating oil from the second cylinder chamber of the single-acting cylinder through the second conduit in response to a change in a pressure in the first cylinder chamber of the single-acting cylinder with respect to a preset pressure when the directional control valve is shifted to and maintained at the first position thereof;



a flow control valve arranged in the first conduit and having an inlet port thereof directly and fluidly connected to both the first cylinder chamber of the single-acting cylinder and the third conduit, and an outlet port thereof directly connected to the directional control valve, the flow control valve controlling a flow of the operating oil in the first conduit when the operating oil is allowed to flow out of the first cylinder chamber of the single-acting cylinder, to thereby generate a pressure differential thereacross; and

a second pilot-operated valve arranged in the third conduit and urged to a first position thereof providing short-circuit fluid connection between the first and second chambers of the single-acting cylinder through the third conduit when the directional control valve is shifted to the second position thereof, the second pilot-operated valve being connected to said first conduit at a position adjacent to said outlet port of said flow control valve, through a pilot line, and shifted from the first position thereof to a second position thereof to allow only the operating oil to flow from the second to first cylinder chamber of the single-acting cylinder, when the directional control valve is shifted to the first position.

5,065,665

DIRECTIONAL CONTROL VALVE FOR PNEUMATIC CYLINDER

Takashi Kimura, Nagoya, Japan, assignor to Hirotaka Manufacturing Co., Ltd., Aichi, Japan

Filed Nov. 28, 1989, Ser. No. 442,210
Claims priority, application Japan, Dec. 5, 1988, 63-307186
Int. Cl.[5] F15B *13/043*
U.S. Cl. 91—433 **7 Claims**

1. A directional control valve for a pneumatic cylinder having a cylinder housing, a piston dividing the cylinder housing into two chambers, and a rod connected to the piston, the directional control valve comprising:

a control valve housing having:

an ambient pressure chamber communicating with an atmosphere surrounding both the pneumatic cylinder and the directional control valve,

a first pressure chamber communicating with an air supply,

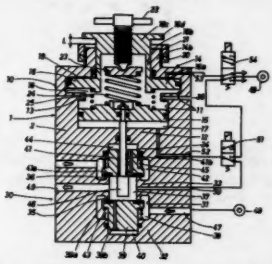
a second pressure chamber communicating with one of the chambers of the cylinder housing, and

a first valve means for selectively allowing communication between the first pressure chamber and the second pressure chamber;

a second valve means for selectively allowing communication between the second pressure chamber and the ambient pressure chamber; and

a control means cavity defined in the control valve housing and having:

a first pressure controlling piston movably mounted in the control means cavity, where a pressure receiving chamber is formed between the control valve housing and a first side of the first pressure controlling piston,



a second pressure controlling piston movably mounted in the control means cavity opposite the first pressure controlling piston, where a pressure controlling chamber is formed between the control valve housing and a first side of the second pressure controlling piston,

a first spring connected to the first pressure controlling piston and the second pressure controlling piston, and

a linkage means secured to the first pressure controlling piston for selectively fully opening, partially opening, and closing each of the first valve means and the second valve means corresponding to a movement of the first pressure controlling piston; and

an air supply/removal means having a third valve means for allowing the pressure receiving chamber to communicate selectively with the second pressure chamber, air supply and the atmosphere, and

a fourth valve means for allowing the pressure controlling chamber to communicate selectively with the air supply, the atmosphere, in which the fourth valve means further communicates with the third valve means.

5,065,666

SEQUENCE VALVE

Terry G. Young, Spring, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 27, 1990, Ser. No. 516,076
Int. Cl.[5] F15B *13/07*
U.S. Cl. 91—518 **24 Claims**

1. An apparatus for directing fluid pressure from a primary source to at least two actuators, comprising:

a body;

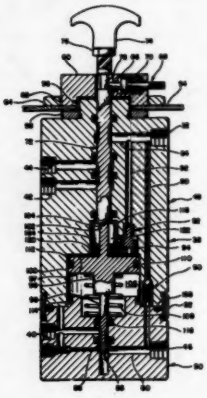
at least one inlet into said body for admitting primary source pressure;

at least one first actuator outlet in said body;

at least one second actuator outlet in said body;

spool means selectively movable in said body manually and by fluid pressure from the primary source for selective sequential alignment of the pressure at said inlet to said first and then second actuator outlets as said spool means

moves in a first direction, and for selective sequential venting of the pressure at said first and second actuator outlets from said body and isolation of said inlet as said spool means moves in a second direction, opposite said first direction, upon loss of fluid pressure at said inlet;



said spool means selectively manually operable in said second direction to vent at least one of said outlets while isolating it from said inlet.

5,065,667

HEATING OR AIR CONDITIONING CONTROL DEVICE FOR A MOTOR VEHICLE

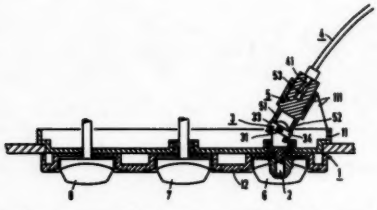
Elmar Ziegler, Ahorn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 8, 1990, Ser. No. 520,263

Claims priority, application European Pat. Off., May 16, 1989, 89108771.0

Int. Cl.[5] B60H *1/00*; F16H *35/18*; F16D *3/10*

U.S. Cl. 98—2 **12 Claims**



1. A climate control device for a motor vehicle, comprising:

air ducts leading to the interior of a motor vehicle;

adjustable air vents associated with at least one of said air ducts;

a control panel;

at least one control knob supported in said control panel, said control knob providing various control settings, and said control knob having a torque shaft that is axially fixed in space so that it can not swivel with respect to the control panel;

a flexible steel shaft set at an oblique descending angle relative to said torque shaft;

a universal joint connection coupling the flexible steel shaft and the torque shaft; and

wherein the movement of the control knob results in a corresponding movement of the flexible steel shaft, which in turn provides a setting movement at the air vents.

5,065,668

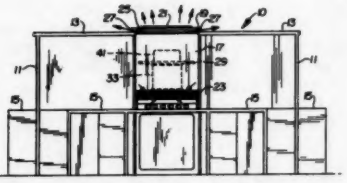
AIR CIRCULATION SYSTEM

George Mitchell, Rosemont, and Michael H. Pelosi, III, Downingtown, both of Pa., assignors to Centercore, Inc., Wayne, Pa.

Filed Jun. 11, 1990, Ser. No. 536,179

Int. Cl.[5] F24F *7/007, 13/06*

U.S. Cl. 98—31.5 **28 Claims**



1. An apparatus for use with a workspace comprising:

a plurality of core walls defining an enclosed core, said core walls including air inlet means at or below a predetermined height;

platform means positioned in said core at a location above said predetermined height and including a platform substantially separating said core into a lower air intake chamber and an upper air discharge chamber, said platform further including filter means in said lower chamber and air transfer means for drawing air from said intake chamber through said filter to said upper chamber; and

core lid means positioned at the top of said core and including air discharge means, said discharge means including side vent means proximate each of said core walls for discharging air in a substantially horizontal direction out from each of said core walls, and further including individual baffle means on each core wall for directing air out of said side vent means.

5,065,669

DEVICE FOR CONVEYING COLD AND/OR WARM SUPPLY AIR INTO A SPACE

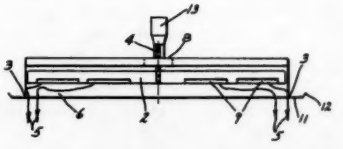
Gottfried Müller, and Paul Hipp, both of Kolbingen, Fed. Rep. of Germany, assignors to Schako Metallwarenfabrik, Kolbingen, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 586,956

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 8911555[U]

Int. Cl.[5] F24F *13/06*

U.S. Cl. 98—40.11 **8 Claims**



1. A device for conveying air from an outlet opening into a space comprising a frame body positioned about said outlet opening so as to define a conduit downstream of said outlet opening, a swirl disk arranged within said conduit, said swirl disk having aperture means for feeding air passing therethrough such that the air emerges from said swirl disk substantially horizontally and displacement means associated with said swirl disk for displacing said swirl disk within said conduit toward and away from said outlet opening to a retracted and extended position such that when said swirl disk is in its retracted position the air emerging from said swirl disk contacts said conduit and is redirected by said conduit substantially vertically downwards into the space and when said swirl disk

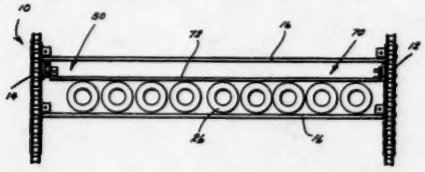
is in its extended position the air emerging from said swirl disk emerges substantially horizontally into the space.

5,065,670

CONVEYOR FOR DOUGHNUT FRYER

Michael E. Leiweke, Arnold, Mo., assignor to Continental Baking Company, St. Louis, Mo.

Filed Apr. 19, 1991, Ser. No. 687,975
Int. Cl.[5] A47J 37/12
U.S. Cl. 99—405 17 Claims



1. A doughnut fryer flight conveyor for selectively advancing different size dough forms through the hot oil bath of a doughnut frying machine, said conveyor comprising:

a pair of spaced, endless conveyor chains;

a plurality of primary flights extending between said chains in spaced, parallel relationship;

a plurality of secondary flights; and

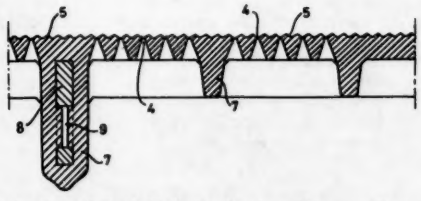
a plurality of secondary flight mounting means each joined to one of said secondary flights for mounting each of said secondary flights on said chains in between an adjacent pair of primary flights, said mounting means permitting each of said secondary flights to be moved from an inoperative position to an operative position defining a reduced flight pitch to permit smaller size dough forms to be advanced by the conveyor than can be advanced by said primary flights.

5,065,671

PLASTIC CHEESE MOLD WITH DRAINAGE SLITS FORMED DURING THE MANUFACTURE OF THE UPRIGHT WALL BY INJECTION MOULDING

Hendrikus M. Tameris, Rotterdam, Netherlands, assignor to Crellin B.V., Rotterdam, Netherlands

Filed Oct. 11, 1989, Ser. No. 420,555
Claims priority, application Netherlands, Oct. 11, 1988, 8802492
Int. Cl.[5] A01J 25/13; B29C 33/40, 33/42; B65D 6/34
U.S. Cl. 99—456 15 Claims



1. A substantially rigid plastic cheese mold, comprising:

at least one upright injection molded plastic wall, the wall being substantially rigid and having an inner side and an outer side and having drainage slits formed therethrough,

the wall further having whey discharge recesses formed therein which open into the drainage slits,

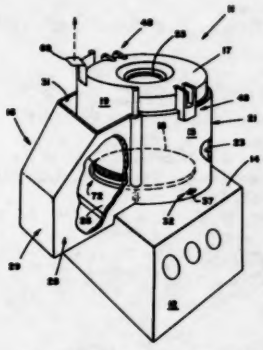
the drainage slits having substantially smooth injection molded surfaces which diverge outwardly from the inner side to the outer side of the wall, the drainage slits further being disposed in rows which are staggered relative to each other, as seen in the vertical direction.

5,065,672

PEELER FOR GARLIC OR THE LIKE WITH CENTRIFUGAL DISCHARGE

George J. Federighi, Sr., 70 13th St., San Francisco, Calif. 94103

Filed Oct. 29, 1990, Ser. No. 604,098
Int. Cl.[5] A23N 7/00
U.S. Cl. 99—631 15 Claims



1. Apparatus for peeling a food product of the type having an abradable skin, said apparatus having a housing with a sidewall bounding a processing chamber, an abrasive disk in said chamber and means for rotating said abrasive disk, wherein the improvement comprises:

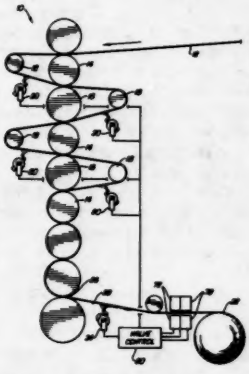
said chamber having an outlet opening at said sidewall which outlet opening is sufficiently small to prevent passage of said food product through said outlet opening during peeling operations while being sufficiently large to receive peelings which are abraded from said food product, said outlet opening being located in proximity to the periphery of said abrasive disk whereby centrifugal force expels said peelings from said chamber through said outlet opening during said peeling operations.

5,065,673

CROSS-DIRECTIONAL MOISTURE CONTROL SYSTEM AND METHOD

Bruce S. Taylor, San Jose, and Ramesh Balakrishnan, Stanford, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Sep. 19, 1989, Ser. No. 409,628
Int. Cl.[5] B30B 13/00; D21G 1/00
U.S. Cl. 100—40 22 Claims



15. A method for controlling the amount of a first material

physically associated with a calendered sheet, comprising the steps of:

a. calendering the sheet using a calender stack having at least one nip;

b. discharging an independently controlled amount of a working fluid, including the first material, at and toward each of a plurality of cross-directional sections of the sheet substantially immediately after the sheet has left the last nip of the calender stack; and

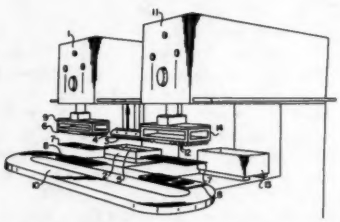
c. then collecting the calendered sheet on a collection device.

5,065,674

SYSTEM FOR PERMEATION PRINTING A PLASTIC BODY

Kazuhiro Kobayashi; Hifumi Kouguthi, and Toshio Hara, all of Ichihara, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Division of Ser. No. 174,065, Mar. 28, 1988, Pat. No. 4,980,221. This application Sep. 12, 1990, Ser. No. 581,838
Claims priority, application Japan, Mar. 7, 1988, 65-51572
Int. Cl.[5] B41F *17/00*
U.S. Cl. 101—44 **16 Claims**



1. A system of permeation printing a plastic body having a shaped surface, said system comprising:

A) a first device for forming an ink image on the shaped surface of the plastic body from an intaglio matrix having an image-forming intaglio grooves, said first device including:

i) means for selectively inking the intaglio grooves of the intaglio matrix;

ii) a printing pad having a surface which adheres ink but does not absorb ink;

iii) means for pressing the printing pad onto the inked surface of the intaglio matrix to cause the image-forming ink from the intaglio grooves to adhere to the printing pad;

iv) means for bringing the printing pad into contact with the shaped surface of the plastic body to transfer the ink image from the printing pad to the plastic body; and

v) means for transferring the printing pad between the intaglio matrix and the plastic body; and

B) a second device, separate and independent from said first device, for causing the ink image to permeate into the plastic body, said second device including:

i) a covering pad having a surface approximately complementary to the shaped surface of the plastic body; and

ii) means for bringing the covering pad, without any ink on its surface, in close contact with the shaped surface of the plastic body to cover the shaped surface so that evaporation of the ink from the shaped surface of the plastic body is prevented while the ink permeates into the plastic body to form a permeated ink image on the shaped surface of the plastic body, the period of time in which the covering pad is in close contact with the plastic body being substantially longer than the time in which the printing pad is in contact with the plastic body,

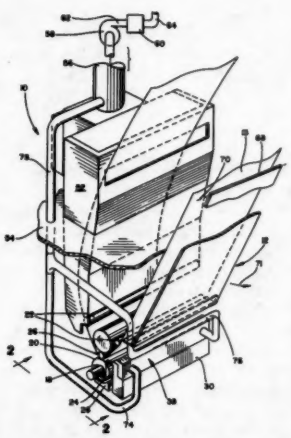
whereby each plastic body to be printed is first subjected to the application of ink by the first device and is thereafter subjected to the ink image permeation by the second device.

5,065,675

BOUNDARY LAYER AIR SCRAPER FOR A ROTOGRAVURE PRINTING PRESS

Lee C. Tapper, Winona Lake, Ind., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Feb. 7, 1991, Ser. No. 652,012
Int. Cl.[5] B41F *9/10, 9/16*
U.S. Cl. 101—153 **11 Claims**



1. In a rotogravure printing press including,

a rotatable printing cylinder having an outer surface,

a rotatable impression roller forming a pinch with said printing cylinder,

means for directing a moving web to be printed through the pinch, movement of said web drawing air to said printing cylinder,

an ink fountain for applying ink having a volatile solvent to the surface of said printing cylinder for transfer to said moving web in said pinch,

a scavenger adjacent the pinch for capturing air drawn to said printing cylinder by movement of said web, which air has become laden with solvent from the ink on said printing cylinder, to minimize the dispersion of solvent laden air to the area surrounding said printing press,

the improvement comprising an air scraper having:

a panel adjacent said moving web and extending upstream of the web from a first end adjacent said pinch and scavenger to a second end spaced therefrom; and

a scraper blade at said first end of the panel and extending from the panel toward the web, said scraper blade blocking the flow of air drawn by the web to the printing cylinder and reducing the volume of solvent laden air to be captured by said scavenger.

5,065,676

AXIALLY REVERSING ROLLER FOR PRINTING PRESSES AND SHEET COATING MACHINES

Philip J. Hardin, 850 Park La., Elm Grove, Wis. 53225

Continuation of Ser. No. 892,901, Aug. 4, 1986, abandoned. This application Apr. 8, 1988, Ser. No. 178,871
Int. Cl.[5] B41F *31/00*
U.S. Cl. 101—349 **19 Claims**

1. A roller for use in a printing or coating machine, comprising:

a shaft for being mounted to said machine,

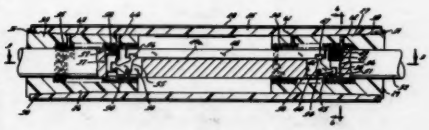
a cylindrical roller mounted for rotating on said shaft in

response to being driven rotationally and for oscillating axially on said shaft,

generally cylindrical means fixed in said roller for rotating with the roller, said means containing internal left and right hand threads arranged coaxially with each other and encircling said shaft,

first and second axially spaced apart follower members mounted in said shaft for moving radially between extended and retracted positions, said first follower member arranged for engaging and disengaging said right hand internal thread and said second follower member arranged for engaging and disengaging said left hand internal thread when said follower members are alternately contracted and extended, so as to cause said roller to oscillate axially on said shaft,

a first striker element fixed in said right hand thread and a second striker element fixed in said left hand thread for



respectively determining the limits of axial travel of said roller in opposite directions on said shaft when said roller is rotating in one direction and for causing axial reversal of said roller,

link means disposed for shifting in an axially extending slot in said shaft,

one lever means pivotal on said shaft and operatively connected to said first follower member and one end of said link means and another lever means pivotal on said shaft and operatively connected to said second follower member and the other end of said link means, the force of one striker element striking one follower member disengaging said follower member from an internal thread and actuating one lever connected to said member and link to transmit said force lengthwise of said link for actuating the other lever to force the other follower into engagement with the other internal thread for reversing the axial travel direction of said roller.

5,065,677

PRINTING PLATE MOUNTING AND PROOFING APPARATUS

Charles B. Leader, Jr., Napoleon, Ohio, assignor to Leader Engineering Fabrication Inc., Napoleon, Ohio

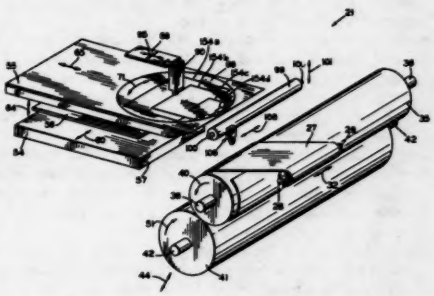
Filed Dec. 27, 1989, Ser. No. 457,558
Int. Cl.[5] B41F *27/06*
U.S. Cl. 101—415.1 **31 Claims**

1. An apparatus for mounting flexible printing plates on a printing cylinder comprising:

means for rotatably supporting a printing cylinder in a predetermined position;

a support table adjacent said means for rotatably supporting and having a turntable formed therein for supporting a flexible printing plate having a reference point thereon; and

means for moving coupled to at least one of said support table and said means for rotatably supporting for moving said one along at least two of three orthogonal axes for positioning said turntable at a desired position along said axes relative to said means for rotatably supporting whereby a printing plate on said turntable has a reference



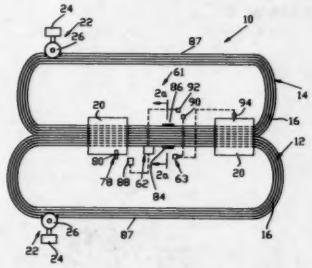
point at said desired position relative to a printing cylinder on said means for rotatably supporting.

5,065,678

CONVEYOR SYSTEM WITH TRANSVERSE PUSHER TO TRANSFER LOAD CARRIER BETWEEN SEPERATE CONVEYING PATHS

Arthur B. Rhodes, 3347 Camp Ground Rd., Louisville, Ky. 40211

Filed Aug. 14, 1990, Ser. No. 566,832
Int. Cl.[5] B61J *3/04*
U.S. Cl. 104—88 **12 Claims**



1. A conveyor system, comprising:

a first conveyor track defining a first conveyor path;

a second conveyor track defining a second conveyor path, a portion of the length of said second conveyor path being in close proximity to a portion of the length of said second conveyor track;

at least one load carrying unit movable with said first conveyor track and said second conveyor track;

conveyor track engaging and disengaging means associated with each load carrying unit for movement between a conveyor track engaging position engaging the individual load carrying units to one or the other of said first and second conveyor tracks with which the load carrying unit is aligned for movement therewith, and a conveyor track disengaged position disengaging the individual load carrying unit from said first or second conveyor track;

activating means located in the area whereat said first and second conveyor tracks are in close proximity to each other, said activating means being movable between a first position whereat it activates said load carrying unit engaging and disengaging means to the conveyor track disengaged position for disengaging said load carrying unit from the aligned one of said first or second conveyor tracks when said load carrying unit is at said activating means, and a second position whereat it activates said load carrying unit engaging and disengaging means to the

conveyor track engaging position for engaging said load carrying unit to said first or second conveyor track;

first control means for operating said activating means to said first position as a load carrying unit moving with the aligned one of said first or second conveyor tracks approaches said activating means;

pusher means directly engaging said load carrying unit and fixedly located near said activating means for pushing said load carrying unit at said activating means out of alignment with one of said first and second conveyor tracks and into alignment with the other one of said first and second conveyor tracks;

second control means for operating said pusher means to push said load carrying unit at said activating means out of alignment with one of said first and second conveyor tracks and into alignment with the other one of said first and second conveyor tracks;

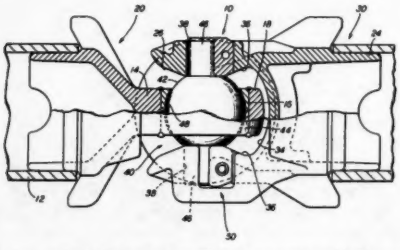
third control means for operating said activating means to said second position when said load carrying unit has been pushed by said pusher means out of alignment with one of said first and second conveyor tracks and into alignment with the other one of said first and second conveyor tracks for engaging the load carrying unit with the other one of said conveyor tracks for movement therewith.

5,065,679

ARTICULATED COUPLING APPARATUS FOR CONNECTING ADJACENT ENDS OF A PAIR OF RAILWAY CARS TOGETHER IN A SEMIPERMANENT MANNER

William D. Wallace, Chicago, Ill.; Edward G. Lynch, Jr., Saugus, Calif.; David W. Daugherty, Jr., Bolingbrook; Wajih Kanjo, Lockport, both of Ill., and Michael G. Hawryszkow, Munster, Ind., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 8, 1990, Ser. No. 520,687
Int. Cl.[5] B61D *15/00*
U.S. Cl. 105—3 **46 Claims**



1. An articulable-type coupling apparatus which can be retrofitted to existing railway cars and is capable of connecting together, in a substantially semipermanent manner, at least one predetermined end of a first railway car to an adjacent predetermined end of a second railway car, said articulable-type coupling apparatus comprising:

(a) a male connection member in which a first end thereof is configured in a manner that will enable said male connection member to be engaged with and connected to one predetermined end of a center sill member disposed substantially along a longitudinal centerline of one of such first railway car and such second railway car;

(b) an aperture having a predetermined size and a predetermined shape, formed through a predetermined portion of a second end of said male connection member, said aperture has a longitudinal axis that is disposed transverse to a longitudinal axis of said male connection member and is in a substantially horizontal plane;

(c) a female connection member in which a first end thereof is configured in a manner that will enable said female connection member to be engaged with and connected to an adjacent predetermined end of a center sill member disposed substantially along a longitudinal centerline of an opposite one of such first railway car and such second railway car;

(d) a cavity formed in a second end of said female connection member, which receives therein at least a portion of each of said second end of said male connection member and said aperture formed through said predetermined portion of said second end of said male connection member, said cavity having a substantially horizontally-disposed bottom wall portion, a substantially vertically-disposed back wall portion connected along a bottom edge thereof to a rear edge of said bottom wall portion, and a pair of vertically-disposed side wall portions connected along a bottom edge thereof to said bottom wall portion and along a rear edge thereof to said back wall portion, a vertically-disposed plane which intersects a geometric centerline of each respective one of said pair of side wall portions being substantially parallel to each other, an inner surface of each of said bottom wall portion and said rear wall portion and said pair of side wall portions define a predetermined size and a predetermined shape of said cavity which is open adjacent a top and front surface thereof;

(e) an opening formed through a predetermined portion of each of said pair of side wall portions, each opening at least includes a slot-like portion adjacent an upper surface of a respective side wall portion, said each opening having a predetermined configuration;

(f) a bearing assembly, said bearing assembly includes:

(i) a substantially spherical member, at least a predetermined portion of which is positioned within said aperture formed through said predetermined portion of said second end of said male connection member, said spherical member having a predetermined diameter,

(ii) a race assembly having a substantially spherical inner surface positioned around said predetermined portion of said spherical member positioned within said aperture to enable movement of said male connection member in relation to said female connection member in both a vertical direction and a horizontal direction over a predetermined range, said race assembly having an outer surface which is substantially identical to said predetermined size and said predetermined shape of said aperture formed through said predetermined portion of said second end of said male connection member,

(iii) a first securing means engageable with each of said race assembly and said second end of said male connection member for securing said race assembly and said spherical member to said second end of said male connection member; and

(iv) a pair of shaft members extending outwardly a predetermined length from axially-opposed surfaces of said spherical member, one of said pair of shaft members being engaged in a respective one of said opening formed through said each of said pair of side wall portions of said cavity in said second end of said female connection member, at least a portion of each of said pair of shaft members having a substantially identical configuration as at least a portion of said predetermined configuration of said opening formed through said side wall portions; and

(g) a second securing means engageable with at least one of said pair of shaft members and a portion of said opening formed through said side wall portions for securing said bearing assembly to said female connection member and thereby securing said male connection member to said female connection member to form said articulable-type coupling apparatus.

5,065,680

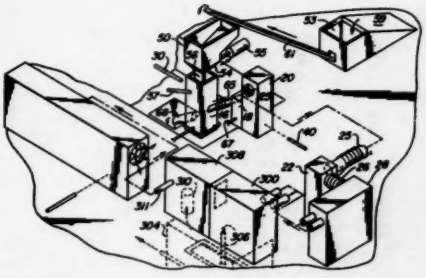
METHOD AND APPARATUS FOR MAKING SOLID WASTE MATERIAL ENVIRONMENTALLY SAFE USING HEAT

Eric Cheetham, Cogan Station, Pa., assignor to Phoenix Environmental, Ltd., Montgomery, Pa.

Continuation-in-part of Ser. No. 410,560, Sep. 21, 1989, Pat. No. 4,960,380. This application Jun. 4, 1990, Ser. No. 533,653

Int. Cl.[5] F23B 7/00

U.S. Cl. 110—342 24 Claims



1. A process for removing harmful constituents from non-combustible solid waste material, comprising the steps of:

continuously feeding a particulate mix of solid waste material and a combustible excitation material for providing heat energy into a reaction chamber,

reacting the mix in said chamber in the presence of oxygen until the solid waste material becomes a molten slag and the temperature within the chamber above the molten slag is high enough to destroy substantially all of the harmful constituents of the gaseous effluent by the formation of the molten slag,

conducting excess molten slag from the reaction chamber,

conducting the gas and particulate effluent generated by the formation of the molten slag from the reaction chamber and rapidly cooling the effluent to cause the particulate material to precipitate out of the effluent,

treating the effluent to remove substantially all of the remaining particulate and harmful constituents of the effluent to achieve acceptable environmental quality,

and releasing the treated effluent into the atmosphere.

5,065,681

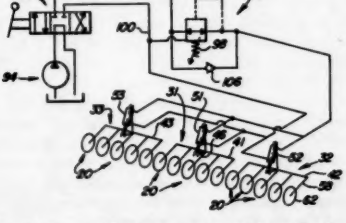
HYDRAULIC DOWN PRESSURE STRUCTURE FOR AN IMPLEMENT WITH MULTIPLE GROUND ENGAGING TOOLS

Howard C. Hadley, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 10, 1990, Ser. No. 595,323

Int. Cl.[5] A01C 5/06; A01B 63/32

U.S. Cl. 111—55 14 Claims



6. In an implement having a transversely extending frame and at least first and second gangs of opener assemblies connected to corresponding first and second rockshafts for independent vertical rocking with respect to the frame between lowered field-working positions and raised transport positions, down pressure structure comprising:

first and second cylinders connected to the first and second rockshafts, respectively;

conduit means connecting the cylinders to a source of hydraulic fluid under pressure for operating the cylinders in parallel to apply down pressure to the first and second opener assemblies when in the lowered field-working positions; and

pressure regulator means connected to the conduit means for maintaining a preselected pressure at the first and second cylinders to rotate the rockshafts and thereby establish a preselected average down pressure for the opener assemblies of each of the gangs, the average down pressure of the opener assemblies of the first gang being substantially equal to that of the average down pressure of the opener assemblies of the second gang.

5,065,682

EMBROIDERING MACHINE

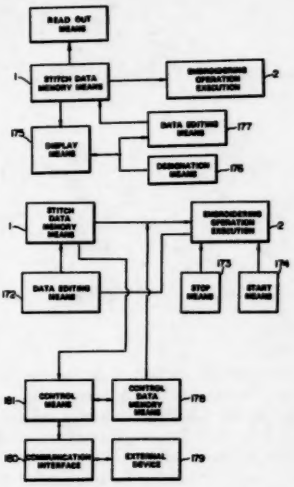
Ikuo Tajima, and Hideo Hasegawa, both of Kasugai, Japan, assignors to Tokai Kogyo Mishin Kabushiki Kaisha, Japan

Division of Ser. No. 222,100, Jul. 20, 1988, Pat. No. 5,001,996. This application Jul. 10, 1990, Ser. No. 550,470

Claims priority, application Japan, Jul. 22, 1987, 63-1181196; Aug. 19, 1987, 63-204184; Sep. 17, 1987, 63-231177; Oct. 2, 1987, 63-248121

Int. Cl.[5] D05C 5/04; D05B 21/00

U.S. Cl. 112—103 8 Claims



5. An embroidering machine comprising:

stitch data memory means for storing stitch data for realizing an embroidering operation corresponding to a desired embroidery design;

means for executing the embroidering operation in accordance with the stitch data;

reading out means for reading out from said stitch data memory means, stitch data that corresponds to the entire embroidery design;

display means for displaying an image of the entire embroidery design in accordance with the stitch data read out by said reading out means;

designation means for designating, on a screen of said display means, a desired stitch position in the displayed embroidered design; and

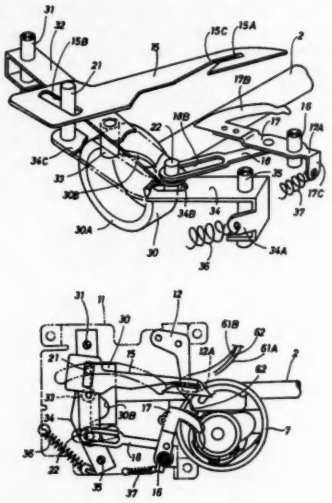
data editing means for changing or setting the stitch data corresponding to the stitch position designated by said designation means.

5,065,683

THREAD TRIMMER MECHANISM FOR SEWING MACHINES

Kazutoshi Hayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 7, 1990, Ser. No. 624,086
Claims priority, application Japan, Jan. 12, 1990, 2-5532
Int. Cl.[5] D05B *65/02*
U.S. Cl. 112—292 14 Claims



10. A sewing machine capable of cutting needle thread and bobbin thread in a bed thereof comprising:

a reciprocable needle having the needle thread;

a rotatable loop taker for catching and extending a loop of the needle thread in said bed;

a bobbin rotatably disposed in said loop taker for supplying the bobbin thread;

a thread cutting device provided in said bed for cutting the needle thread and the bobbin thread at a position between an upper surface of said bed and said loop taker;

restricting means movable between a separating position at which said restricting means separates from said bobbin and an abutting position at which said restricting means abuts on said bobbin for restricting spinning of said bobbin;

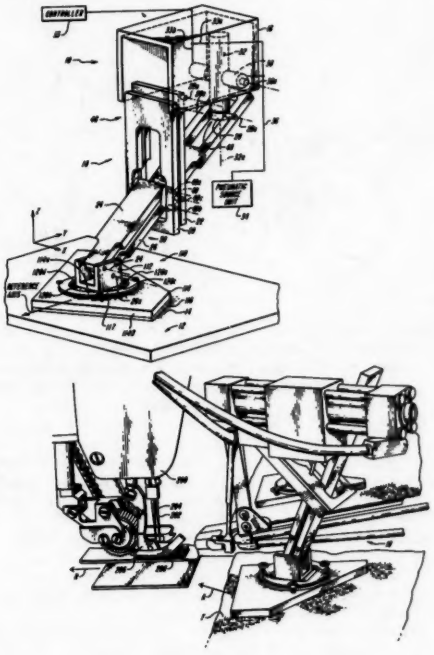
first moving means for moving said restricting means from said separating position to said abutting position before said cutting device cuts the needle thread and the bobbin thread and after said loop taker rotates a predetermined angle with the loop of the needle thread, so that said restricting means abuts on a portion of said bobbin where the loop of the needle thread has already passed over.

5,065,684

LIMP MATERIAL SEGMENT TRANSPORT APPARATUS FOR SEWING MACHINES

Mitchell L. Hansberry, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 15, 1990, Ser. No. 523,666
Int. Cl.[5] D05B *21/00, 27/00*
U.S. Cl. 112—311 10 Claims



1. Apparatus for transporting a material segment along a reference axis on a substantially planar work surface comprising:

A. a base member positioned above said work surface;

B. a segment coupling assembly;

C. a four-bar linkage means for coupling said segment coupling assembly to said base member; wherein said linkage means includes:

i. a first elongated bar assembly having length L1 and pivotally coupled at a first end thereof to a first point P1 on said base member,

ii. a second elongated bar assembly having length L2 and extending along a link axis and an associated means for controlling said length L2 of said second bar assembly in a range L2-1 to L2-2, where L2-1 is less than L2-2, in the direction of said link axis, said second bar member being pivotally coupled at a first end thereof to a second point P2 on said base member, said first point P1 being spaced apart from said second point P2,

iii. a third elongated bar assembly having length L3 and having a first end and a second end, said third bar assembly being pivotally coupled at said second end thereof to the second end of said second bar assembly, and being pivotally coupled at an intermediate point P3 between said first and second ends thereof, to the second end of said first bar assembly,

iv. means for pivotally coupling said segment coupling assembly to said first end of said third bar assembly about a coupler axis substantially parallel to said work

surface and substantially perpendicular to said reference axis, and

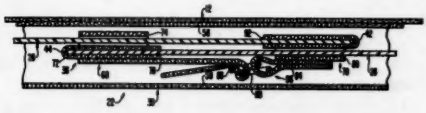
v. an actuator including means for selectively rotating said second bar assembly about a pivot axis extending through said point P2 between a first angle A1 and a second angle A2 measured with respect to an axis normal to said work surface, wherein L1, L2, and L3, and P1, P2, and P3, and A1 and A2 are such that as said second bar assembly is rotated by said actuator between angle A1 and angle A2 with the length of said second bar assembly being L2-1, said segment coupling assembly travels along a substantially straight path substantially parallel and adjacent to said reference axis and as said second bar assembly is rotated by said actuator between angle A2 and angle A1 when the length of said second bar assembly is L2-2, said segment coupling assembly travels in a non-straight path.

5,065,685

MARINE SAIL WITH BATTEN ATTACHMENT ASSEMBLY

William H. Stevenson, IV, P.O. Box U, St. Michaels, Md. 21663

Filed Jul. 2, 1990, Ser. No. 546,834
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—102 **44 Claims**



1. A batten attachment assembly for a marine sail, the combination comprising:

first and second battens, each of said battens having first and second ends with a longitudinal axis extending between said first and second ends;

pocket means, adapted to be coupled to a sail body, for supporting said battens in their operative positions relative to the sail body, said pocket means having a longitudinal axis; and

means, located in said pocket means and coupled to said battens, for resisting movement of said battens relative to said pocket means, and for orienting said longitudinal axes of said battens substantially parallel to said longitudinal axis of said pocket means.

5,065,686

SAIL BATTEN COMPRESSION ADJUSTMENT FITTING

Lewis R. Foster, 112 Bond Ct., Los Gatos, Calif. 95302

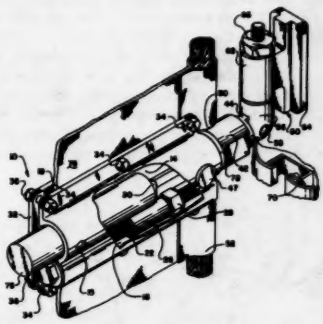
Filed Feb. 22, 1991, Ser. No. 659,086
Int. Cl.[5] B63H *9/06*
U.S. Cl. 114—103 **23 Claims**

19. A compression adjustment fitting for adjusting the compression in a sail batten, comprising:

a housing having a batten receptacle formed therein for receiving a batten, and an adjustment assembly receptacle formed therein, said batten receptacle and said adjustment assembly receptacle having longitudinal axes offset with respect to one another;

batten engaging means positioned in the housing for engaging a batten located in the batten receptacle; and

adjusting means positioned in the adjustment assembly receptacle and accessible from outside the housing and associated with the batten engaging means for adjusting the position of the batten engaging means within the housing to thereby permit the compression in a batten positioned in the batten receptacle to be easily adjusted from



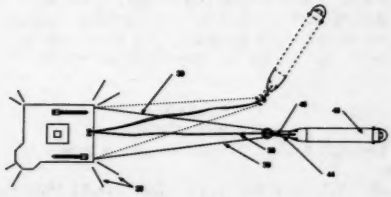
outside the housing through operation of the adjusting means.

5,065,687

MOORING SYSTEM

James E. Hampton, c/o Hampco, Wood International Centre, Aberdeen, Scotland ABL 4AG

Filed Mar. 21, 1990, Ser. No. 497,138
Claims priority, application United Kingdom, Apr. 11, 1989, 8097/89
Int. Cl.[5] B63B *21/00*
U.S. Cl. 114—230 **7 Claims**



1. A loading arrangement comprising a mooring system for locating a buoy adjacent to a permanently moored vessel, in which the buoy is connected to two horizontally spaced apart points on the permanently moored vessel, and is also connected to the seabed by a single tether extending downwardly from the buoy to maintain a predetermined minimum distance between the buoy and the permanently moored vessel such that the buoy floats with its connection to the two spaced apart points in tension; and in which there is means for a mobile vessel to ride to the buoy.

5,065,688

FLEXIBLE WEAPON HANDLING SUPPORT SYSTEM

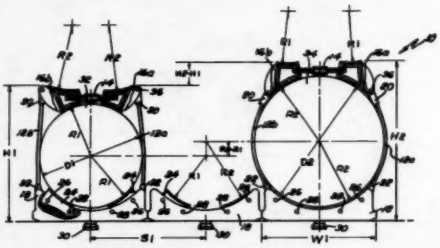
Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jun. 20, 1990, Ser. No. 544,294
Int. Cl.[5] B63G *8/32*
U.S. Cl. 114—238 **5 Claims**

1. Apparatii for storing and restraining cylindrical weapons of preselected smaller and larger diameters D1 and D2 respectively onboard a submarine, said submarine having a pre-configured weapon support structure for receiving said apparatii so as to produce a preplanned weapon storage arrangement, each said apparatus comprising:

a base means, affixed to said weapon support structure of said submarine, said base means providing a support cradle to said weapon, said base means further comprising, a

dolly base having a preselected width and at least one button attached to the underside thereof, said dolly base being affixed to said support structure by said at least one button, first and second bottom pads, each said bottom pad having a first arcuate surface on one side thereof of diameter D1 and a second arcuate surface on the obverse side of a diameter D2 adjustably attached to said dolly base, for selectably supporting a preselected weapon diameter, first and second pivot pins, one each moveably attached through a corresponding said bottom pad to said dolly base at a point near the outer extremity of said dolly base, and first and second position pins, one each movea-



bly attached through a corresponding said bottom pad to said dolly base at point near the button on said dolly base;

a pair of flexible lashing straps of equal length, one end of each said flexible strap being attached to said base means, extending generally vertically from said base means and contacting the outer surface of said weapon, for securing said weapon to said base means; and

clamping means, in contact with the top outer cylindrical surface of said weapon and attached to the other end of said pair of flexible lashing straps, for providing, in cooperation with said flexible lashing straps and said base means, said storage and restraint of said weapon.

5,065,689

TURRET DEVICE

Ivar Krogstad, Arendal, Norway, assignor to Pusnes A/S, Norway

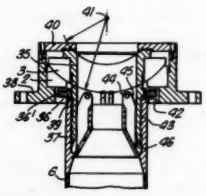
PCT No. PCT/NO88/00077, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/03338, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 12, 1988, Ser. No. 473,961

Claims priority, application Norway, Oct. 12, 1987, 874246

Int. Cl.[5] B63B *21/50*

U.S. Cl. 114—230 **13 Claims**



1. A turret device adapted to be anchored to the ocean floor, and a floating structure for supporting the turret device in an upper axial bearing and a lower radial bearing to allow the floating structure to turn freely around the turret device, characterized in that the upper bearing is a self-aligning spherical bearing (2, 3) in direct contact between the floating structure and the turret device, wherein the upper spherical bearing includes first and second bearing members each having curved mating bearing surfaces, the bearing surfaces being in engagement with each other and movable relative to each other, wherein the first bearing member is non-rotatably fixed to the floating structure and the second bearing member is fixed to the turret device.

5,065,690

SWIMMING POOL LEAK DETECTOR

Donald T. Bontempo, 14 Haskell Ave., Everett, Mass. 02149

Filed Aug. 27, 1990, Ser. No. 573,677

Int. Cl.[5] G01M *3/20*

U.S. Cl. 116—264 **2 Claims**

1. A leak detector for the detection of a leak in a filled swimming pool, comprising:

(a) a billiard-cue-shaped receiver having a handle end, a tip and a longitudinal axis, and containing a reservoir at the handle end, said receiver having a channel, the channel extending from the tip of said receiver to said reservoir; and

(b) a plunger slidably disposed along the longitudinal axis within said reservoir within said receiver;

wherein said plunger, when pulled outwardly away from the tip, may draw dye solution in which the tip has been immersed through the channel into the reservoir, and, when pushed inwardly toward the tip, may expel the dye solution from the reservoir through the channel; and

wherein said leak detector, by expelling said dye solution near a leak in a filled swimming pool, will locate the leak due to the suction caused by said leak's drawing the dye solution toward said leak.

5,065,691

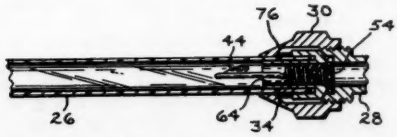
FLUID FLOW INDICATOR

Jack E. Brighton, 15460 Cadmus Rd., Hudson, Mich. 49247

Filed Oct. 22, 1990, Ser. No. 600,666

Int. Cl.[5] G01P *13/00*

U.S. Cl. 116—274 **4 Claims**



1. A fluid flow indicator for use with a light transmitting conduit having an end fitting having a cylindrical bore and an end releasably interconnected with an adapter comprising, in combination, a base having a longitudinal axis and first and second ends, a passage defined through said base between said ends, said base having a cylindrical exterior surface of a diame-

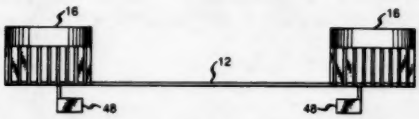
ter closely receivable within the fitting bore, an elongated indicator support axially extending from said base first end a sufficient distance to be located within the light transmitting conduit, a flow indicator flag rotatably mounted on said support having a drive surface obliquely related to said axis whereby fluid flow through the conduit rotates said flag, and an abutment defined on said base adjacent said base second end engaging the adapter and fitting end to axially locate and maintain said base relative to the fitting.

5,065,692

SOLDER FLUX APPLICATOR

David B. Hollesen, Easton, Pa.; Joseph W. Kaczorek, Neshanic Station, and Edwin S. Treible, Ringoes, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 30, 1990, Ser. No. 516,635
Int. Cl.[5] B05B *15/02*
U.S. Cl. 118—302 3 Claims



1. Apparatus for depositing a liquid onto a substrate with substantial uniformity as the substrate is transported linearly along a predetermined path of travel, comprising:

a first closed tank containing a volume of liquid;

a spray gun directed at the substrate;

means for pumping liquid from the tank into the gun so that the gun will spray the liquid in a predetermined pattern onto the substrate;

traversing means for reciprocating the gun along a path generally perpendicular to the path of travel of the substrate so that the spray pattern made by the gun during each pass at least partially overlaps the pattern made during the previous pass of the gun in the opposite direction, thereby assuring substantial uniformity of deposition;

a brush mounted to contact the gun at least once while the gun is being reciprocated;

a second closed tank containing solvent; and

means coupled to said second tank and said brush for automatically supplying solvent to the brush from the tank at periodic intervals so that the brush is continuously saturated with solvent.

5,065,693

DEVELOPING DEVICE

Kunihisa Yoshino, Mitaka; Mitsuo Motohashi, Fuchu, and Yozo Fujii, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,023
Claims priority, application Japan, Feb. 19, 1990, 2-36380; Feb. 19, 1990, 2-36381; Feb. 19, 1990, 2-36383
Int. Cl.[5] G03G *15/09*
U.S. Cl. 118—657 20 Claims

1. A developing device for use in an image recording apparatus, comprising:

(a) a developer stirring means for stirring developer;

(b) a developer supply means for supplying the developer stirred by the developer stirring means;

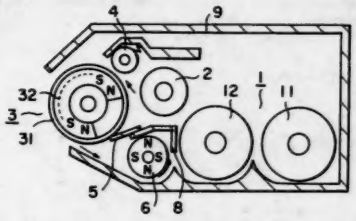
(c) a developer holding means for attracting the supplied developer onto a surface thereof and for conveying the developer to a developing area;

(d) a height regulating means for regulating a layer thickness of the developer on the surface of the developer holding means;

(e) a developer removing means for removing residual developer from the surface of the developer holding means after development;

(f) a magnetic conveying means for conveying the removed residual developer toward the developer stirring means; and

(g) a mechanical conveying means for removing developer from the surface of the magnetic conveying means and for



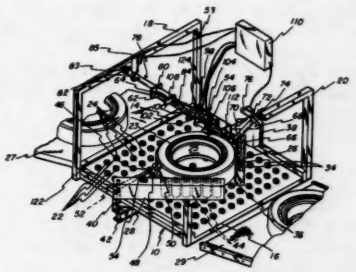
conveying the developer to the developer stirring means, the mechanical conveying means being disposed between the magnetic conveying means and the developer stirring means.

5,065,694

AUTOMATIC WHITE SIDEWALL SPRAYING APPARATUS

William G. Earnheart, Jr., Tupelo, Miss., assignor to Cooper Tire and Rubber Co., Findlay, Ohio

Filed Aug. 20, 1990, Ser. No. 570,054
Int. Cl.[5] B05C *7/02*
U.S. Cl. 118—669 18 Claims



1. A device for spraying a coating on the white sidewall portion of tires comprising:

frame means;

conveying means attached to said frame means for conveying a tire into a predetermined location in said device;

rail means supported by said frame means and located over said conveying means;

a spray head mounted on said rail means for spraying a coating on a tire located in said predetermined location;

actuating means connected to said spray head for moving said spray head relative to said frame means; and

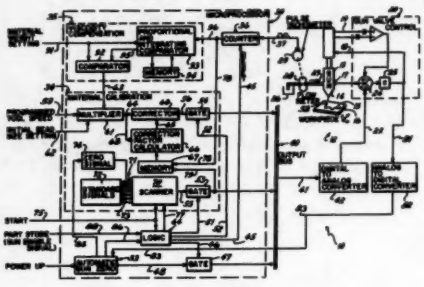
sensor and control means such as to locate the white sidewall portion of a tire and to control said actuating means to precisely position said spray head over the white sidewall portion to spray a coating thereon.

5,065,695

APPARATUS FOR COMPENSATING FOR NON-LINEAR FLOW CHARACTERISTICS IN DISPENSING A COATING MATERIAL

Carl N. Baron, Mayfield Heights; Stephen L. Merkel, Bay Village, and Robert C. Hall, Strongsville, all of Ohio, assignors to Nordson Corporation, Ewestlake, Ohio

Filed Jun. 16, 1989, Ser. No. 367,388
Int. Cl.[5] B05C *11/10*
U.S. Cl. 118—688 13 Claims



13. A fluid dispensing apparatus comprising:

fluid dispensing means including controller means responsive to a control signal for varying the rate at which fluid is dispensed from said dispensing means;

flow measuring means for measuring the flow rate at which material is dispensing from said fluid dispensing means;

a control signal generator including means responsive to an input signal for generating a control signal to said dispensing means which is effective to cause the flow rate of fluid dispensed by said dispensing means to vary in a predetermined relationship to said input signal;

said dispensing means being responsive to a bipolar control signal to respectively open and close the dispensing means; and, said dispensing means further including:

means operable to generate a progressively increasing zeroing signal to said dispensing means,

feedback means for monitoring the polarity of said bipolar signal, and

means for storing a dispensing means zeroing signal in response to a change in the polarity of said feedback signal.

5,065,696

TEMPERATURE CONTROLLED DISTRIBUTOR BEAM FOR CHEMICAL VAPOR DEPOSITION

William M. Greenberg, Oregon, and Randall L. Bauman, Perrysburg, both of Ohio, assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Continuation-in-part of Ser. No. 245,444, Sep. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 50,466, May 18, 1987, Pat. No. 4,793,282. This application Mar. 6, 1990, Ser. No. 489,002
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—718 3 Claims

1. An apparatus for depositing a coating material on a surface of a glass sheet comprising:

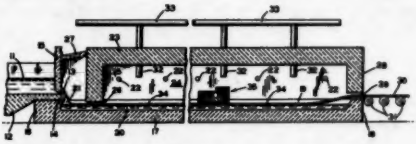
at least a pair of plenums for receiving separate coating gases and each having an outlet;

a mixing chamber having an inlet connected to said plenum outlets and an outlet adapted to be positioned adjacent a surface of a sheet of glass to be coated, said mixing chamber being defined by spaced apart walls of blocks of material having a relatively high thermal conductivity;

a support defining a cooling fluid duct;

insulating material positioned between said plenums and said support and between said blocks and said support; and

cooled fastener means for attaching said plenums, said blocks and said insulating material to said support including a threaded fastener extending through said blocks and



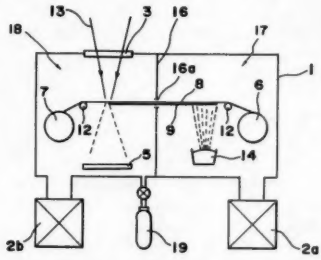
said insulating material and threadably engaging said support, a bushing extending between a head of said threaded fastener and said support and through which said threaded fastener extends, said threaded fastener having a relatively high coefficient of thermal conductivity, and said bushing being formed of an insulating material.

5,065,697

LASER SPUTTERING APPARATUS

Yoshikazu Yoshida, Izumi; Kunio Tanaka, Toyonaka, and Yukio Nishikawa, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 27, 1990, Ser. No. 559,270
Claims priority, application Japan, Jul. 28, 1989, 1-197747
Int. Cl.[5] C23C *16/48*
U.S. Cl. 118—719 4 Claims



1. A laser sputtering apparatus, comprising:

a vacuum chamber;

a laser for radiating a laser beam;

a vacuum sealing window disposed in said chamber for transmitting the laser beam from said laser into said chamber;

a film transporting means for transporting a film in said chamber such that said film passes by said window, said film having a high laser transmission characteristic and a surface over which a material to be sputtered onto a substrate is deposited, said surface being directed toward a position of the substrate;

a substrate holder arranged in said vacuum chamber facing said film and said window for holding the substrate; and

an evaporation device arranged in said vacuum chamber for evaporating and depositing the material to be sputtered onto said film inside said vacuum chamber.

5,065,698

FILM FORMING APPARATUS CAPABLE OF PREVENTING ADHESION OF FILM DEPOSITS

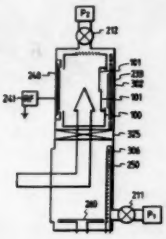
Atsushi Koike, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 337,312, Apr. 13, 1989, abandoned. This application Mar. 25, 1991, Ser. No. 674,314

Claims priority, application Japan, Apr. 11, 1988, 63-90407; Apr. 11, 1989, 1-91633

Int. Cl.[5] C23C *16/00*

U.S. Cl. 118—719 7 Claims



1. A film forming apparatus for forming a film on a substrate set inside at least one film forming chamber capable of being evacuated, comprising;

said film forming chamber in which the film is formed on said substrate;

a deposit shield member to prevent deposits from being adhered on the inner wall surface of said film forming chamber, said deposit shield member subject to absorption of gas on surfaces thereof;

at least one vacuum chamber capable of being evacuated and in which said deposit shield member is changed for a new one, wherein said vacuum chamber includes a baking means to enhance elimination of gas absorbed on said surface of said deposit shield member;

an open-shut means provided between said vacuum chamber and said film forming chamber, to keep airtightness between said vacuum chamber and said film forming chamber; and

a carrying means to carry said deposit shield member between said vacuum chamber and said film forming chamber.

5,065,699

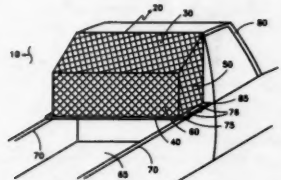
MOBILE PET PROTECTION CAGE

Shelly Marshall, Box 766, Tok, Ak. 99780

Filed Dec. 1, 1989, Ser. No. 444,520

Int. Cl.[5] A01K *31/00*

U.S. Cl. 119—17 12 Claims



1. A mobile pet animal protection cage for use in a pickup truck having an uncovered flat bed, a cab having a rear wall and a sliding rear window in said rear wall, said cage comprising:

first, second, third, fourth, fifth and sixth boundaries defining surface planes which enclose a volume between said cab rear wall and said flat bed whereby said volume is accessible by a pet to and from said cab when said sliding rear window is open;

said sixth boundary facing and adjacent said rear wall and having an opening aligned with said rear window,

said first boundary facing and adjacent said flat bed;

said second, third, fourth and fifth boundaries being made of mesh material through which the driver can see but through which the animal cannot chew; and

means for detachably securing said cage to said truck.

5,065,700

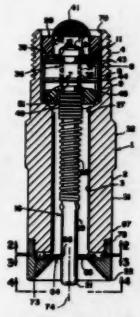
SHUTTER FOR ANIMAL-WATERING VALVE

David L. Cross, Benicia, Calif., assignor to Se Lab Group, Inc., Cincinnati, Ohio

Filed Oct. 17, 1990, Ser. No. 599,045

Int. Cl.[5] A01K *7/00*

U.S. Cl. 119—725 7 Claims



1. A shutter assembly in combination with an animal-watering valve which includes a valve housing having a distal portion, a cylindrical passage formed therein having an upstream end and a downstream end, a valve lever arm having no passage for water there through mounted in said cylindrical passage for pivotal movement between a valve closed centered position and a valve open radially displaced position dimensioned to permit flow of water between said valve lever arm and said cylindrical passage, biasing means engaging said valve lever arm for centering said valve lever arm within said cylindrical passage, and said shutter assembly comprising:

a. a movable disc shaped shutter member having an outer periphery which surrounds said valve lever arm and non sealably substantially covers said cylindrical passage when said valve lever arm is in said closed centered position for preventing an animal from stuffing material into said cylindrical passage; and

b. means adapted for attachment to said valve for positioning said disc shaped shutter member adjacent said downstream end of said cylindrical passage when said valve lever is in said closed centered position and permitting flow past said disc shaped shutter member when said valve lever arm is in said valve open radially displaced position.

5,065,701

NECK HOLDING DEVICE FOR LIVESTOCK

Harvard A. Punt, RR, Hull, Iowa 51239

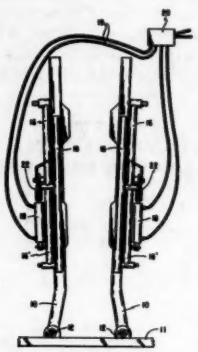
Filed Oct. 1, 1990, Ser. No. 590,966

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—147.1 5 Claims

1. In combination with a stanchion gate having vertical members for holding the head and neck of an animal, means for extending said neck comprising a pair of auxiliary bars extendibly attached to said vertical members and engageable with said

head of said animal, said bars being moveable transversely of said gate and in a direction to move said head away from said gate, separate power means connected between said gate and each of said bars to move said bars transversely of said gate,



each of said separate power means being connected between said gate and one of said pair of bars, and control means adapted to control said power means to cause each of said bars to move at the same rate as the other.

5,065,702

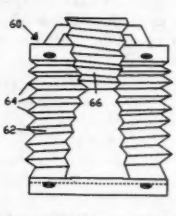
DISPOSABLE LITTER CONTAINER

Aaron S. Hasiuk, 1310 Frost Hallow Rd., Levittown, Pa. 19101

Filed Feb. 19, 1991, Ser. No. 657,524

Int. Cl.[5] A01K *1/00*

U.S. Cl. 119—168 **9 Claims**



1. An extensible disposable litter container for receiving the waste of household pets, the container being extensible from a closed position to an open position, the container comprising:

a rectangular tray having a floor and opposing sides and ends for containing litter material;

a rectangular cover member having opposing sides and ends, the cover member having a handle extending therefrom, the cover member being releasably attached to the tray when the container is in the closed position, the cover member having at least one vent communicating with the atmosphere;

a collapsible wall extending between the rectangular tray and the cover member and enclosing the interior of the container, the wall having a door formed therein for entry and egress of household pets; and

at least one spring means extending between the tray and the cover member, the spring means being compressed when the container is in the closed position, the spring means extending the cover member from the tray when the cover member is released from the tray and the container assumes the open position.

5,065,703

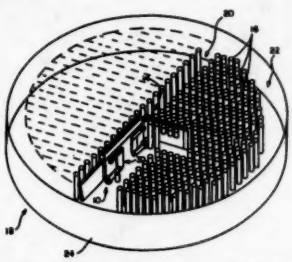
FLEXIBLE LANCE FOR STEAM GENERATOR SECONDARY SIDE SLUDGE REMOVAL

Robert A. S. Lee, Stoneham, Mass., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 27,810, Mar. 18, 1987, Pat. No. 4,827,953. This application Jan. 27, 1989, Ser. No. 303,268

Int. Cl.[5] F22B *37/52*

U.S. Cl. 122—382 **43 Claims**



1. A system comprising, in combination, a flexible means for accessing an assembly having a difficult to access geometry, which comprises a flexible member, a flexible cable extending lengthwise along and being movable within said flexible member, and an optical cable extending lengthwise along and within said flexible member, said flexible member being configured to be driven into the difficult to access geometry, a rigid guide extending lengthwise of said flexible member, said flexible member being movably mounted along said rigid guide, said rigid guide having a curved end positioned to turn said flexible member in a predetermined angle with respect to an extending direction of said flexible member as said flexible member passes from said rigid guide through said curved end, a drive means for driving said flexible member through the curved end of said rigid guide, a transporter for said combination, in which said rigid guide comprises a body of said transporter, and at least one transporter drive means attached to said body.

5,065,704

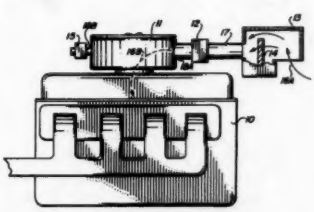
INTERNAL COMBUSTION ENGINE AND KIT THEREFORE

Robert C. Powell, P.O. Box 894, Patagonia, Ariz. 85624

Filed Nov. 16, 1990, Ser. No. 614,858

Int. Cl.[5] F02M *25/04*

U.S. Cl. 123—25 J **20 Claims**



1. An engine assembly comprising:

a) an internal combustion engine in which fuel is burned in air;

b) an air filter having a primary port for directing a supply of air to said internal combustion engine; and,

c) an adjustable humidifier having,

1) an evaporative pad, a portion of the surface of said evaporative pad located in an air stream to said air filter,

2) adjustment means for selectively increasing or decreasing the surface area of said evaporative pad exposed to said air stream,

3) a reservoir for storage of purified liquid water, and,

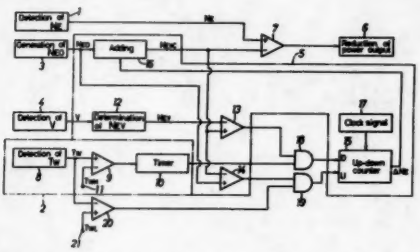
4) a water pump for recirculating purified liquid water from said reservoir over said evaporative pad.

5,065,705

SYSTEM FOR PREVENTING OVERHEAT OF ENGINE FOR VEHICLE

Sachito Fujimoto, and Yuzuru Koike, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1990, Ser. No. 551,980
Claims priority, application Japan, Jul. 14, 1989, 1-82795
Int. Cl.[5] F01P *5/14*
U.S. Cl. 123—41.15 3 Claims



1. A system for preventing an overheat condition of an engine for a vehicle, comprising:

a revolution rate detector for detecting a rate of revolution of the engine;

a power output reducing means receiving an output of said revolution rate detector for reducing engine power output when a revolution rate detected by said revolution rate detector exceeds a preset revolution rate;

a vehicle velocity detector for detecting a vehicle velocity;

an overheat condition predicting means for predicting an impending overheat condition of the engine; and

a revolution rate correcting means for reducing said preset revolution rate in accordance with a reduction of the vehicle velocity in response to prediction of an impending engine overheat condition by said overheat condition predicting means.

5,065,706

COOLED PLUNGER PISTON FOR INTERNAL COMBUSTION ENGINES

Josip Zvonkovic, Fellbach, Fed. Rep. of Germany, assignor to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/00760, § 371 Date Mar. 21, 1990, § 102(e) Date Mar. 21, 1990, PCT Pub. No. WO89/02982, PCT Pub. Date Apr. 6, 1989
PCT Filed Mar. 25, 1988, Ser. No. 466,375
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732925
Int. Cl.[5] F01P *1/04*
U.S. Cl. 123—41.35 1 Claim

1. A cooled plunger piston for internal combustion engines comprising

a) a piston head,

b) a piston stem mutually separate from said piston head for pivotal connection to said head by way of a gudgeon pin,

c) bosses depending from said piston head having aligned apertures for accommodating the gudgeon pin, which bosses on assembly project into the piston stem and extend in the direction of the negative pressure side of the piston to a lesser extent in the region of that end of the stem which is towards the piston head than in the region underneath and disposed in direction of the bottom end of the stem,

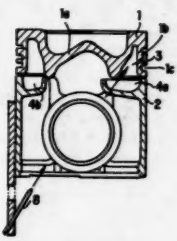
d) a closed annular space defined radially outwardly by said piston head, said space being open towards the piston stem,

e) oil collection pockets formed in the upper end of the piston stem which is towards the piston head and disposed at opposite positive and negative sides of the piston, which pockets at least partially cover the annular space of the piston head, and

f) an oil injection nozzle disposed in the region of said collecting pockets for introducing cooling oil through the bottom end of the stem into the annular space of the piston head,

g) said injection nozzle being so disposed that the cooling oil is only injected on one side of a diagonal plane passing through the piston stem simultaneously in the longitudinal axis of the piston and gudgeon pin,

h) the area of one of said collecting pockets of the stem in the covered region of the annular space and projected onto a plane extending vertically to the longitudinal axis of the



piston being in the region of the negative pressure side smaller than the area of a collecting pocket on the positive pressure side of the piston,

i) the smaller collecting pocket of the piston stem being radially larger in the areas disposed between the bosses of the piston head than in the areas directly adjacent the bosses,

j) said larger collecting pocket having, compared with the smaller collecting pocket, the greater capacity to hold cooling oil in relation to the area covering the annular space,

k) said larger collecting pocket, at its part directly opposite the bosses, being spaced from the maximum extension of the bosses in the negative pressure direction radially inwardly by a distance, said smaller collecting pocket being spaced from the maximum extension of the bosses in the positive direction radially inwardly, the spacing at the positive pressure side being at least the same size as the spacing at the negative pressure side.

5,065,707

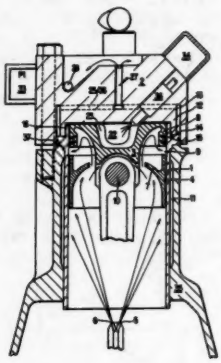
OIL-COOLED CYLINDER HEAD

Ludwig Elsbett; Günter Elsbett, and Klaus Elsbett, all of Industriestrasse 14, D-8543 Hilpoltstein, Fed. Rep. of Germany

PCT No. PCT/DE88/00731, § 371 Date May 24, 1990, § 102(e) Date May 24, 1990, PCT Pub. No. WO89/04916, PCT Pub. Date Jun. 1, 1989
PCT Filed Nov. 25, 1988, Ser. No. 477,957
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1987, 3739899
Int. Cl.[5] F01P *3/00*
U.S. Cl. 123—41.42 10 Claims

1. An internal combustion engine, particularly a four-stroke engine, comprising wall means defining a cylinder having an open end; a piston in said cylinder having an end face which confronts said open end, said piston being movable axially of said cylinder between a first position in which said end face is adjacent to said open end and a second position in which said end face is remote from said open end; a piston ring mounted on said piston and spaced from said end face, said wall means having a portion which extends between said open end and

said piston ring when said piston is in said first position; a cylinder head covering said open end and having cooling channel means arranged to cool said portion of said wall means; and means for circulating cooling oil through said channel means, said channel means constituting the sole means for cooling said portion of said wall means by heat exchange with fluid flowing in a channel.



5,065,708

INTERNAL COMBUSTION ENGINE FOR A PORTABLE HANDHELD WORK APPARATUS

Anton Wehle, Fellbach; Klaus Höppner, Marbach, and Hermann Weiss, Steinheim, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Nov. 1, 1990, Ser. No. 607,663

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3936629

Int. Cl.[5] F02M *29/00*

U.S. Cl. 123—52 MC **15 Claims**

1. An internal combustion engine for a portable handheld tool such as a motor-driven chain saw, cutoff machine or the like, the internal combustion engine comprising:

a cylinder having a cylinder wall defining a combustion chamber;

said cylinder wall having an inlet opening formed therein for passing a combustion mixture into said combustion chamber;

said cylinder wall defining a flange formed in surrounding relationship to said inlet opening;

an induction elbow for passing the combustion mixture into said inlet opening, said induction elbow being made of a rubber-elastic material and having a connecting end for connecting said induction elbow to said flange;

said connecting end defining an inner wall surface having an annular shoulder formed thereon so as to have a first volume;

said flange having an annular slot formed therein so as to have a second volume approximately equal to said first volume;

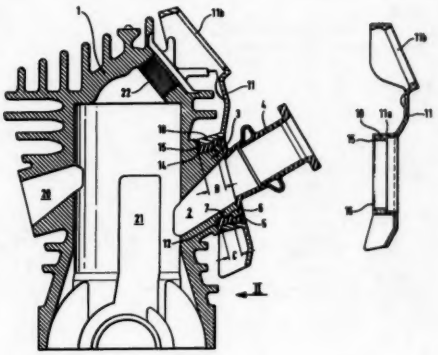
said connecting end being mounted on said flange with said shoulder being disposed in said slot;

a clamp ring having a fixed inner diameter;

said clamp ring being pushed over said connecting end for holding said connecting end on said flange;

said clamp ring having an inner clamping surface defining said fixed inner diameter and said clamping surface and said slot conjointly defining a space therebetween when said clamp ring is pushed over said connecting end; and,

said fixed inner diameter of said clamp ring being selected so as to cause said clamping surface to radially compact said annular shoulder in said space to stiffen the material of said annular shoulder thereby securely connecting said connecting end to said flange.



5,065,709

VALVE OPERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Yasutoshi Ito; Toshihiro Kamiyama, and Fuminori Kawashima, all of Saitama, Japan, assignors to Honda Giken Koyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1990, Ser. No. 548,123

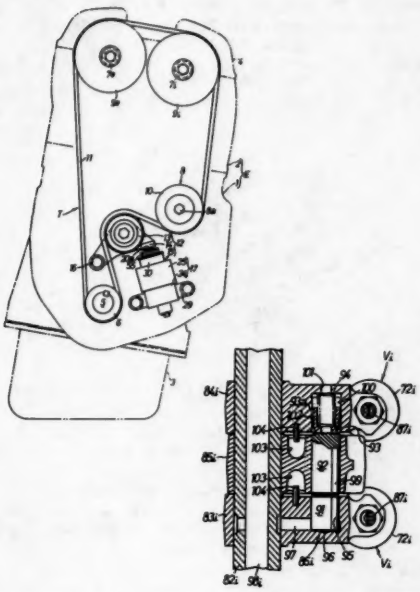
Claims priority, application Japan, Jul. 6, 1989, 1-79660[U]

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.15 **1 Claim**

1. A valve operating system for an internal combustion engine comprising a valve-operation driving force transmission means interposed between a valve operating camshaft and an engine valve carried in an engine body for opening and closing operation of the engine valve, a valve operation mode changeover mechanism provided in said valve-operation driving force transmission means and capable of switching the opening and closing mode of the engine valve in accordance with the operating condition of the engine, and a wrapping connector type transmission system provided between said valve operating camshaft and a crankshaft, wherein said valve operating system further includes a tension adjusting means capable of adjusting the tension of a transmitting band of the

wrapping connector type transmission system, and a control means for controlling the operation of said tension adjusting means in accordance with the operation mode of said valve operation mode changeover mechanism.



5,065,710

ROPE STARTER

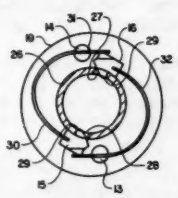
Sören N. Henriksson, Källered, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jul. 25, 1990, Ser. No. 558,067

Claims priority, application Sweden, Aug. 8, 1989, 8902691

Int. Cl.[5] F02N *3/02*

U.S. Cl. 123—185 B **6 Claims**



1. A rope starter for an internal combustion engine including a rope wheel **(12)** with a starting rope **(24)** and a driver **(26)**, said driver cooperating with starting latches **(15,16)** on a rotatable fly-wheel coaxial with the rope wheel, said fly-wheel being secured on the crankshaft of the engine, said fly-wheel being provided with support lugs projecting on the fly-wheel defining respective supports **(13,14)** for the starting latches **(15,16)**, said starting latches surrounding said driver **(26)** and being each provided with a hook part **(29)** and a spring member **(30,32)**, characterized in that each latch has its spring member extended in a curve and fixed to a respective support and the hook part connectable to the driver as well as to a stop means defined by a respective support lug.

5,065,711

INTERNAL COMBUSTION ENGINES

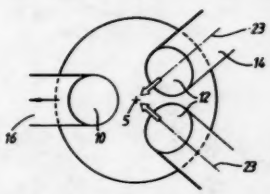
Samuel Lesley, Shoreham-by-Sea, England, assignor to Ricardo Group PLC, Shoreham-by-Sea, England

Filed Dec. 5, 1990, Ser. No. 622,814

Claims priority, application United Kingdom, Dec. 15, 1989, 8928386

Int. Cl.[5] F01L *3/00*

U.S. Cl. 123—188 M **11 Claims**



1. An internal combustion engine including at least one cylinder, said cylinder having an axis, a piston reciprocable within said cylinder and a cylinder head, said cylinder head containing at least one exhaust port, a poppet valve controlling said exhaust port, at least two inlet ports, further poppet valves having respective axes and controlling a respective one of said inlet ports and inlet ducts having respective axes and connected to a respective one of said inlet ports, said inlet ports of directed type whereby, in use, air flowing through them into said cylinder flows preferentially in one radial direction relative to the associated said axis of said further poppet valves generally towards the cylinder axis, said axes of said inlet ducts being convergent and passing substantially through said cylinder axis whereby, in use, the air flows through said inlet ports merged to form a single air flow substantially on said cylinder axis.

5,065,712

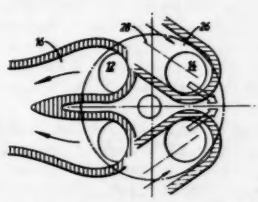
INTERNAL COMBUSTION ENGINES

Giles E. Hundleby, Horsham, England, assignor to Ricardo Group PLC, Shoreham-by-Sea, England

Filed Dec. 5, 1990, Ser. No. 622,541

Int. Cl.[5] F01L *3/00*

U.S. Cl. 123—188 M **7 Claims**



1. An internal combustion engine including at least one cylinder, said cylinder having a wall and an axis, a piston reciprocable within said cylinder and a cylinder head, said cylinder head containing at least one exhaust port, a respective poppet valve controlling said at least one exhaust port, at least two inlet ports, respective further poppet valves controlling said at least two inlet ports and inlet ducts having respective axes and connected to respective inlet ports, said cylinder and said cylinder head defining a combustion chamber with which said inlet and exhaust ports communicate, said inlet ports being of directed type whereby, in use, the flow of air through said inlet ports is generally away from said at least one exhaust port

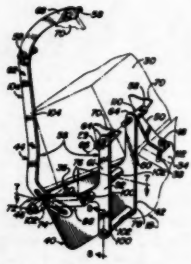
and thus flows down said wall of said cylinder adjacent said inlet ports, said axes of said inlet ducts being convergent in the direction of flow through them and said axis of each said inlet duct defining an angle of at least 20° with that of the adjacent one of the other of said at least two inlet ports, when viewed in the direction of said cylinder axis.

5,065,713

MOUNTING BRACKETS FOR MOUNTING ENGINE ASSECCORIES

William R. Seats, 656 E. Cypress, Covina, Calif. 91723

Filed Apr. 2, 1990, Ser. No. 502,984
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 A **26 Claims**



1. A mounting bracket for mounting an accessory on an internal combustion engine having a forwardly facing front end surface, comprising:

a base portion having a normally rear side to be secured to the engine with said rear side seating against the front end surface of the engine,

means on said base portion forwardly of said rear side and normally projecting above said base portion for mounting the accessory on said base portion with the accessory in a position normally above the base portion, and wherein

said accessory mounting means comprises a pair of normally upstanding accessory support arms joined to and located forwardly of said rear side of said base portion and having normally upper ends which are normally located above said base portion and are aligned on and spaced along a common axis transverse to said rear side of the base portion, a third normally upstanding accessory support arm joined to said base portion and having a normally upper end normally located above the upper ends of said arm pair, and means for securing said upper arm ends to the accessory with the accessory positioned between the upper ends of said arm pair and the upper end of said third arm,

said base portion comprises a flat base plate having a normally upper edge and a normally front side,

one arm of said arm pair is integrally joined to and extends edgewise and normally upwardly from the upper edge of said base plate,

said bracket includes a discrete bracket member at the front side of said base plate having a normally upstanding portion forming the other arm of said arm pair, and means securing said bracket member to said base plate,

said third arm comprises a discrete arm member having a normally lower end, and

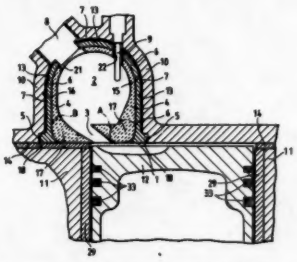
said mounting bracket includes means mounting the lower end of said third arm member on said base portion for adjustment of the third arm relative to said arm pair in a plane substantially parallel to the rear side of said base portion.

5,065,714

HEAT-INSULATING STRUCTURE OF SWIRL CHAMBER AND ITS PRODUCTION METHOD

Hiroshi Matsuoka, Yamato, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,373
Claims priority, application Japan, Jul. 27, 1989, 1-192589
Int. Cl.[5] F02B *19/08, 19/16*
U.S. Cl. 123—254 **6 Claims**



1. In an internal combustion engine including a cylinder block having formed therein cylinder, a cylinder head fixed to said cylinder block and equipped with hole portions formed in such a manner as to correspond to said cylinders for forming swirl chamber, and main combustion chambers formed inside said cylinders of said cylinder block, a heat-insulating structure of a swirl chamber comprising:

swirl chamber blocks having formed therein swirl chambers and made of a ceramic material;

jet ports for establishing communication between said swirl chambers and said main combustion chambers, formed in said swirl chamber blocks in such a manner that the thickness of the formation portions of said jet ports in said swirl chamber blocks is greater than that at other portions;

metallic outer blocks formed by casting a metallic material around the outer surfaces of said swirl chamber blocks so as to apply a compressive force in advance to said swirl chamber blocks;

outwardly projecting flange portions provided on the portions of said outer blocks which corresponds to said jet ports constituting high-temperature portions of said swirl chamber blocks;

inlet portions of said hole portions, which are formed in said cylinder head, in which said flange portions of said outer blocks are fitted firmly so that said flange portions are in contact with the inner surfaces of said inlet portions, for the purpose of letting a part of the heat of said high-temperature portions in which said jet ports are formed escape therefrom to said cylinder head through said flange portions; and

air layers formed between the outer surfaces of said outer blocks and the inner surfaces of said hole portions formed in said cylinder head, for the purpose of preventing heat from flowing from said outer blocks to said cylinder head.

5,065,715

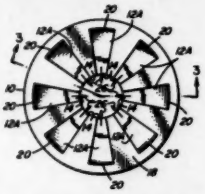
SQUISH JET COMBUSTION CHAMBER

Robert L. Evans, West Vancouver, Canada, assignor to The University of British Columbia, Vancouver, Canada

Filed Feb. 7, 1990, Ser. No. 475,939
Int. Cl.[5] F02B *19/08*
U.S. Cl. 123—263 **12 Claims**

1. An internal combustion engine having a piston reciprocal in a cylinder having a cylinder head, one of said cylinder head and said piston having a compression face, a bowl opening around its periphery onto said compression face, a plurality of squish jet channels arranged in circumferentially spaced relationship about said bowl, each said channel opening onto said face along substantially its full length from an inlet end of said

channel to a discharge end, said discharge end opening into said bowl, said channels providing the main conveying paths of an air fuel mixture into said bowl from the surrounding area of said face, a squish pocket formed on said compression face for each of said squish jet channels, said inlet end of each of said squish jet channels connecting with its respective of said squish pockets, each said squish pocket having an open area the periphery of which opens onto said compression face and having a width significantly larger than the width of said inlet end of



said squish jet channel to which it is connected, the other of said piston and said cylinder being shaped so that as said piston approaches a top dead centre position said air fuel mixture is forced to flow from said compression face into and along said channels from said inlet end to said discharge end and to discharge said air fuel mixture as squish jets issuing one from said discharge end of each said channel into said bowl, in a direction aimed so that at least one of said squish jets intersects with another of said jets.

5,065,716

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH IMPROVED ENGINE ACCELERATION CHARACTERISITCS AFTER FUEL CUT-OFF OPERATION

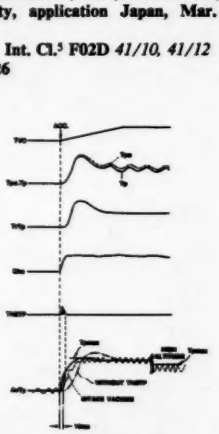
Toyoaki Nakagawa, and Hatsuo Nagaishi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Mar. 23, 1989, Ser. No. 327,550

Claims priority, application Japan, Mar. 25, 1988, 63-39838[U]

Int. Cl.[5] F02D *41/10, 41/12*

U.S. Cl. 123—326 **5 Claims**



1. A fuel supply control system for an internal combustion engine, comprising:

an induction system for introducing a controlled flow rate of intake air and forming an air/fuel mixture to be introduced into an engine combustion chamber;

first sensor for monitoring intake air flow rate flowing through said induction system to produce an intake air flow rate indicative first signal;

second detector for monitoring a predetermined engine driving condition satisfying a fuel cut-off condition to produce a fuel cut-off condition indicative second signal;

first means for controlling fuel supply amount for supplying a controlled amount of fuel into said induction system at a controlled timing determined in relation to an engine revolution cycle, said first means being responsive to said second signal to perform fuel cut-off operation, and said first means being responsive to termination of said second signal, for temporarily performing fuel supply irrespective of engine revolution cycle; and

second means for deriving a fuel supply amount for said temporary fuel supply in response to termination of fuel cut-off, said second means deriving said fuel supply amount for said temporary fuel supply with containing a component compensating a fuel amount required for wetting the periphery of said induction system,

wherein said second means is responsive to initiation of said fuel cut-off operation for latching an instantaneous fuel supply amount upon initiation of fuel cut-off, and subtracting the latched value from an instantaneous fuel supply amount derived upon termination of fuel cut-off for deriving said fuel supply amount for temporary fuel supply, and said second means modifies said fuel supply amount by said compensating component for wetting the periphery of said induction system.

5,065,717

IDLE SPEED CONTROL SYSTEM FOR ENGINE

Tetsushi Hosokai; Tetsuro Takaba; Toshihiro Ishihara, and Hideki Kobayashi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Dec. 27, 1990, Ser. No. 634,601

Claims priority, application Japan, Dec. 28, 1989, 1-338511

Int. Cl.[5] F02D *41/16*

U.S. Cl. 123—339 **1 Claim**

1. An idle speed control system for an engine comprising an idle regulator valve which controls the amount of intake air to be fed to the engine when the engine idles and a control unit which detects an engine speed and controls the opening of the idle regulator valve so that the detected engine speed converges on a target idle speed, characterized in that

said control unit has

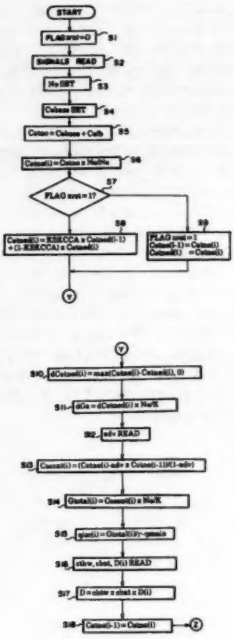
a basic air charging efficiency calculating means which calculates a basic air charging efficiency required to fixedly operate the engine at the target idle speed,

a first target air charging efficiency calculating means which calculates a first target air charging efficiency by feedback correction of the basic air charging efficiency on the basis of a correction value which is determined according to the difference between the detected engine speed and the target idle speed,

a second target air charging efficiency calculating means which calculates a second target air charging efficiency which is the air charging efficiency obtained when the engine is fixedly operated at the detected engine speed while the amount of intake air is kept at a mass flow which will fixedly provide the first target air charging efficiency,

a final target mass flow calculating means which calculates a final target mass flow which provides a first-order lag air charging efficiency equal to the second target air charging efficiency, the first-order lag air charging efficiency being an air charging efficiency which is actually introduced

into the cylinder when the opening of the idle sneed regulator valve is set so that a given mass flow is obtained, and



a valve control means which controls the opening of the idle regulator valve on the basis of the final target mass flow.

5,065,718

ENGINE IDLE CONTROL VALVE

Atsushi Suzuki, Obu, and Toshio Kondo, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 16, 1990, Ser. No. 568,133

Claims priority, application Japan, Aug. 20, 1989, 1-214548; Jul. 17, 1990, 2-188266

Int. Cl.[5] F02M *3/00;* **F02B** *23/00;* **F16K** *31/12*

U.S. Cl. 123—339 **26 Claims**

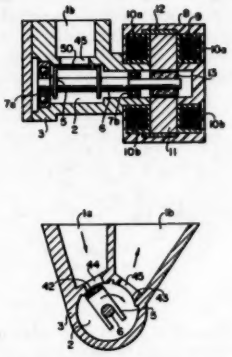
1. An engine idle control valve comprising:

first bypass passage means receiving auxiliary air flow, which bypasses an intake throttle valve of an engine and which is to be coupled to the engine, from an upstream side of an intake throttle valve disposed in an air intake pipe of the engine, and coupling said received auxiliary air to another port thereof;

second bypass passage means having an inlet port which is in communication with said outlet port of said first bypass passage means, receiving said auxiliary air flow introduced through said inlet port and coupling said received auxiliary air to a downstream side of said intake throttle valve;

a valve body for changing an opening area of at least one of said outlet port of said first bypass passage means and said inlet port of said second bypass passage means, thereby adjusting an amount of the auxiliary air flow to be introduced from the upstream side to the downstream side of said intake throttle valve; and

drive means for driving said valve body in accordance with a drive signal such that when a maximum drive signal is input into said drive means, an opening area of at least one of said outlet port of said first bypass passage means and said inlet port of said second bypass passage means is throttled so that a first predetermined amount of the auxiliary air flow smaller than a maximum amount of the auxiliary air flow is introduced through said throttled opening area into the downstream side of said intake throttle valve.



5,065,719

ACTUATING DEVICE FOR A THROTTLE VALVE ARRANGED IN AN INTAKE PIPE OF A DIESEL INTERNAL COMBUSTION ENGINE

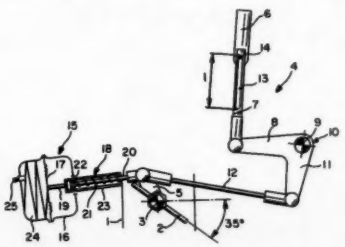
Detlef Panten, Xorb; Gernot Hertweck, Feilbach, and Franz Bender, Wendlingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Sep. 19, 1990, Ser. No. 584,798

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3931144

Int. Cl.[5] F02D *9/10, 11/08*

U.S. Cl. 123—339 **2 Claims**



1. Actuating device for a throttle valve arranged in an intake pipe of a diesel internal combustion engine, having a mechanical adjusting linkage for the load-dependent adjustment of the throttle valve, which linkage has an idle path decoupling the movement of the throttle valve form the movement of an accelerator pedal, wherein an actuator actuated by an auxiliary force is provided, via which actuator the throttle valve position predetermined as a function of load can be altered within an idle path of the actuator;

wherein the actuator is a vacuum actuator with a control diaphragm clamped in a housing;

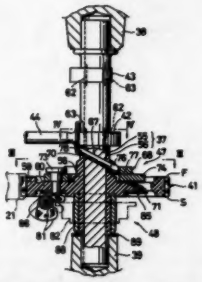
wherein the control diaphragm is coupled to the throttle valve via an actuating rod, the actuating rod comprising two linkage parts which can be displaced telescopically one inside the other and can be pulled apart counter to the force of a spring.

5,065,720

ENGINE WITH MECHANICAL GOVERNOR AND DECOMPRESSION DEVICE

Shigeru Nishiyama, and Hideazu Amano, both of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan

Filed Oct. 18, 1990, Ser. No. 599,409
Claims priority, application Japan, Nov. 2, 1989, 1-286517
Int. Cl.[5] F01L *13/08;* F02D *31/00*
U.S. Cl. 123—363 9 Claims



1. An engine with a mechanical governor and a decompression device, comprising:

a valve actuating camshaft having a valve actuating cam gear and a valve actuating cam arranged side by side thereon, said valve actuating camshaft being rotatably supported by an engine body,

said valve actuating cam gear being provided with a first side surface facing said valve actuating cam and a second side surface on the opposite side to said first side surface,

a centrifugal decompression device provided with a centrifugal weight, means for mounting said centrifugal weight to the first side surface of said valve actuating cam gear in a swingable manner in the centrifugal direction, and

a mechanical governor provided with a governor weight and a member for transmitting a centrifugal force of said governor weight, said governor weight being supported by the second side surface of said valve actuating cam gear by said mounting means, and said member for transmitting the centrifugal force being supported by said valve actuating camshaft outside the second side surface of said valve actuating cam gear.

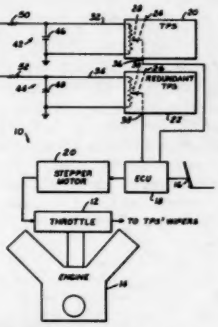
5,065,721

POWER SUPPLY CIRCUIT FOR DUAL THROTTLE POSITION SENSORS OF AN ELECTRONIC ENGINE THROTTLE CONTROL

Kregg S. Wiggins, Clarkston, Mich., and Danny O. Wright, Grafton, Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Mar. 28, 1990, Ser. No. 501,078
Int. Cl.[5] F02B *77/08;* F02D *41/22;* G01M *19/00*
U.S. Cl. 123—399 12 Claims

1. In an internal combustion engine for powering an automotive vehicle and comprising an electronic throttle control wherein engine's throttle mechanism is operated by an electric powered actuator which is under the control of an ECU, and associated with throttle mechanism are two throttle position sensors both supplying current throttle position information that is used by the ECU in exercising control over the actuator, such information being in the form of respective electrical signals from the two throttle position sensors, which signals are derived from a common source of electrical potential, the improvement which comprises means for enabling the ECU to promptly detect the occurrence of a short circuit type failure in one of said throttle position sensors without such short cirtuic



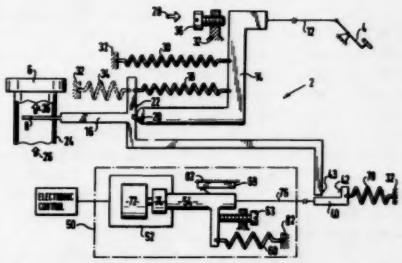
type failure adversely affecting the signal from the other of said throttle position sensors.

5,065,722

APPARATUS HAVING A CONTROL MOTOR FOR INTERVENTION INTO A FORCE TRANSMISSION DEVICE

Werner Huber, Schwaikheim, and Guenter Spiegel, Worms, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 17, 1990, Ser. No. 569,050
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934738
Int. Cl.[5] F02D *7/00*
U.S. Cl. 123—399 22 Claims



1. An apparatus having a control motor (52) for intervention into a force transmission device (2) between an operating element (4) and a control device (8) that determines an output of a driving engine (6), the operating element (4) is operatively connected to a first drive element (14) and the control device is operatively connected to a second drive element (16), a coupling spring (18) is connected on one end to the first driver element (14) and on the other end is connected to the second driver element (16) such that the driver elements are urged to execute a motion relative to one another until a first coupling stop (20) or said first driver element comes to rest on a second coupling stop (22) of said second driver element, an operative member (54) connected to said control motor (52) a transmission means (76) connected to said operative member 54 and to a third drive element (40) which upon a control motor intervention acts upon the second driver element (16) in a direction of reducing an output of the driving engine, a first restoring spring (60) connected at one end to said operating member 54 and at its opposite end to a housing part (82) said operating member (54) of the control motor (52), when intervention is not occurring, is actuated by said first restoring spring (60) counter to a direction of reduction of an output of the driving

engine toward a repose stop (63), wherein the control motor (52) along with the operative member (54), the first restoring spring (60) and the repose stop (63) form a final control element (50) disposed spaced apart from the control device (8).

5,065,723

MARINE PROPULSION DEVICE WITH SPARK TIMING AND FUEL SUPPLY CONTROL MECHANISM

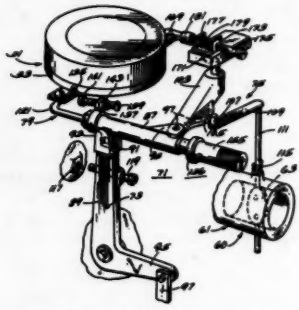
George L. Broughton, Waukegan; Gregory B. Binversie, Grayslake, both of Ill., and Henry C. Billingsley, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 24, 1987, Ser. No. 66,142

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[5] F02P *5/02*

U.S. Cl. 123—413 25 Claims



1. A marine propulsion device comprising a propulsion unit including a rotatably supported propeller, and an engine drivingly connected to said propeller and comprising an engine block, a spark timing mechanism for advancing and retarding the spark between a minimum spark advance and a maximum spark advance, a fuel supply mechanism operable between idle and full speed settings, a control lever supported by said engine block for movement in opposite directions and adapted to be connected to an operator controlled actuating member, and control means connected to said lever and to said fuel supply mechanism and to said spark timing mechanism, and operative in response to control lever movement, for displacing said fuel supply mechanism from said idle setting to a first intermediate setting between said idle setting and said full speed setting without displacing said spark timing mechanism from said minimum spark advance.

5,065,724

IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yuji Takeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 3, 1990, Ser. No. 562,608

Claims priority, application Japan, Aug. 4, 1989, 1-203610

Int. Cl.[5] F02P *5/15*

U.S. Cl. 123—425 9 Claims

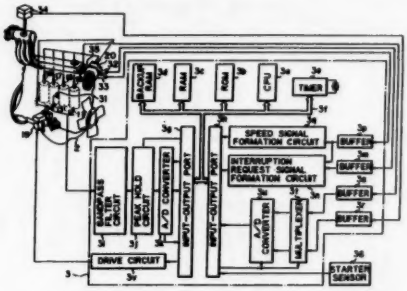
1. An ignition timing control apparatus of an engine having a plurality of cylinders, comprising

detection means for detecting the intensity of vibration of the engine in ranges of crank angles predetermined for the cylinders;

calculation means for calculating for each cylinder a knocking judgement value serving as a criteria for judgement if knocking has occurred based on the intensity of the vibration of the engine in the said predetermined crank angle ranges;

judgement means for judging, when the intensity of the vibration of the engine in the predetermined crank angle ranges exceeds said knocking judgement value, if knocking has occurred at the corresponding cylinders;

ignition timing control means for delaying by a predetermined delay the common ignition timing of all cylinders when knocking has occured; and



delay increase means for increasing the delay when it is judged that knocking has occurred at one of the cylinders, then it is judged that knocking has occurred again at the same cylinder without judgement that knocking has occurred at another cylinder.

5,065,725

PRESSURE CONTROL VALVE, IN PARTICULAR FOR FUEL INJECTION SYSTEMS

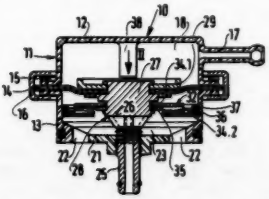
Detlef Spoetter, Korntal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 11, 1991, Ser. No. 640,347

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1990, 4010173

Int. Cl.[5] F02M *41/00*

U.S. Cl. 123—463 20 Claims



1. A pressure control valve (10; 40) for liquid or gaseous media, in particular for fuel injection systems of internal combustion engines, comprising first and second housing elements forming a housing, said second housing element (13, 46) and at least one diaphragm (14, 54) defining a chamber (23; 47) for receiving said media; said second housing part provided with, a tubular neck (25; 45) communicating there with and protruding into the chamber (23; 47), said tubular neck provided with an end face oriented toward the chamber forming a valve seat (26) for a feed valve (28); said feed valve (28) provided with a valve closing element (27; 52) secured at least indirectly to the diaphragm (14; 54), a prestressed spring (32; 41) at least indirectly engaging the second housing element (13; 46) on one side and the valve closing element (27; 52) on the other, said spring (32; 41) comprising a tension spring disposed in the chamber (23; 47) carrying the medium.

5,065,726

LEARNING CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

Martin Klenk, Backnang, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

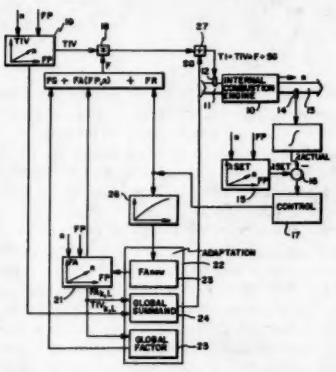
PCT No. PCT/DE89/00135, § 371 Date Oct. 2, 1990, § 102(e) Date Oct. 2, 1990, PCT Pub. No. WO89/09334, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 4, 1989, Ser. No. 585,104

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811262

Int. Cl.[5] F02D *41/14, 41/24*

U.S. Cl. 123—480 5 Claims



2. In a method for learning control with precontrol for setting the lambda value for the air/fuel mixture to be metered to an internal combustion engine, with a precontrol value being corrected with the following: a control output value, adaptation factors and a global summand, the method of determining the global summands comprising the steps of:

forming a large comparison value by averaging adaptation factors for large precontrol values;

forming a small comparison value by averaging adaptation factors for small precontrol values;

comparing the large comparison value to the small comparison value; and,

incrementing the global summand by a correction value whenever the large comparison value is smaller than the small comparison value, and vice versa.

5,065,727

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Shigeyuki Sakaguchi; Tadashi Ariga, and Hirotsugu Maruyama, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 27, 1990, Ser. No. 514,041

Claims priority, application Japan, Apr. 28, 1989, 1-111796

Int. Cl.[5] F02D *41/14, 41/08*

U.S. Cl. 123—489 11 Claims

1. An air/fuel ratio control system for an internal combustion engine, which comprises;

first detecting means for monitoring engine driving conditions including engine revolution speed, engine load and engine coolant temperature to produce a first signal representative of the driving conditions thereof;

second detecting means for monitoring the air/fuel ratio of an air/fuel mixture to be discharged from a combustion chamber of the engine to produce a second signal representative thereof;

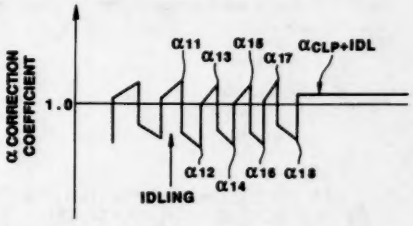
third detecting means for monitoring an engine driving condition to produce a third signal representative of an idling state when the engine is driven in the idling state;

first means for determining engine driving conditions satisfying a predetermined feedback control on the basis of the first signal;

second means for deriving a basic fuel delivery amount on the basis of the first signal;

third means for deriving a correction value for correcting said basic fuel delivery amount on the basis of the second signal;

fourth means for deriving an average value of said correction values for a predetermined period of time after said third signal representative of the idling state is input from said third detecting means while the engine is driven at



said engine driving conditions satisfying the predetermined feedback control, said fourth means modifying said average value of the correction values by adding thereto a predetermined value determined on the basis of said engine coolant temperature, and setting the modified average value as a fixed correction value; and

fifth means for modifying said basic fuel delivery amount to derive a fuel delivery amount by using said correction value before said predetermined period of time elapses and by using said fixed correction value after said predetermined period of time elapses.

5,065,728

SYSTEM AND METHOD FOR CONTROLLING AIR/FUEL MIXTURE RATIO OF AIR AND FUEL MIXTURE SUPPLIED TO INTERNAL COMBUSTION ENGINE USING OXYGEN SENSOR

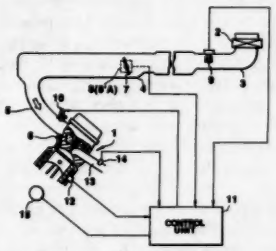
Shinpei Nakaniwa, Gunma, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isezaki, Japan

Filed Jun. 21, 1990, Ser. No. 541,803

Claims priority, application Japan, Jun. 21, 1989, 1-156748

Int. Cl.[5] F02M *51/00*

U.S. Cl. 123—489 28 Claims



1. A system for an internal combustion engine, comprising:

a) a first means for detecting a concentration of an engine exhaust gas component so as to determine whether an air/fuel mixture ratio of an air/fuel mixture sucked into the engine is placed at a rich side or lean side with respect to a stoichiometric air/fuel mixture ratio;

b) second means for setting an air/fuel mixture ratio feedback correction coefficient to correct a quantity of fuel supplied to the engine on a feedback basis in response to the air/fuel mixture ratio detected by the first means so

that the air/fuel mixture ratio approaches the stoichiometric air/fuel mixture ratio;

c) third means for controlling the quantity of fuel supplied to the engine on the basis of the quantity of fuel corrected with the air/fuel mixture ratio correction coefficient set by the second means; and

d) fourth means for detecting a degree of deterioration of the first means from an output characteristic of the first means and correcting an operating variable of the feedback correction coefficient set by the second means according to the degree of deterioration detected so as to compensate for deviation of the air/fuel mixture ratio of the air/fuel mixture detected by the first means from the stoichiometric air/fuel mixture ratio.

5,065,729

CYLINDER RECOGNITION APPARATUS FOR A DISTRIBUTORLESS IGNITION SYSTEM

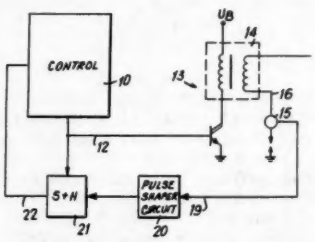
Immanuel Krauter, Erbstetten, and Winfried Klötzner, Maulbronn-Schmie, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/EP88/00221, § 371 Date Jul. 23, 1990, § 102(e) Date Jul. 23, 1990, PCT Pub. No. WO89/08778, PCT Pub. Date Sep. 21, 1989

PCT Filed Mar. 18, 1988, Ser. No. 573,194

Int. Cl.[5] F02P *7/03, 15/08, 17/00*

U.S. Cl. 123—643 **7 Claims**



1. In a cylinder recognition apparatus for a distributorless ignition system of an internal combustion engine having at least two cylinders operating in a plurality of cycles, each of said cycles having a power stroke and an exhaust stroke, comprising ignition control means for generating a plurality of ignition signals, a signal distributor connected to the ignition control means and arranged to be connected to ignition coils associated with two of the cylinders, detection means for generating a signal indicative of spark generation in one of the cylinders of the internal combustion engine, processing means for processing the signal generated by the detection means, and control circuitry responsive to the processing means for outputing a control signal indicative of the cylinder which is operating in the power stroke of the cycle of the engine, said detection means having a single detector for detecting an output pulse from the signal distributor to one of the two cylinders of the engine the improvement wherein said processing means comprises a peak value circuit for generating a peak value signal representing the peak amplitude of the signal generated by the detection means, and further comprising means for evaluating a magnitude of the peak value signal of the peak amplitude detected by the peak value circuit in one of the cycles to determine whether said one of the two predetermined cylinders is in one of a power stroke condition and an exhaust stroke condition.

5,065,730

ARCHERY BOW STRING PROP

Ernst P. Kluver, 11716 Tompkins Rd., Rives Junction, Mich. 49277

Filed Aug. 14, 1990, Ser. No. 567,178

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—35.2 **2 Claims**

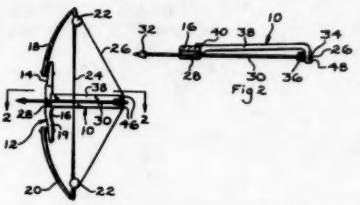


Fig 2

1. A bow string prop for archery bows having a hang grip, a pair of limbs extending from the hand grip in opposite directions having ends, and a bow string extending between the ends of the limbs, comprising, in combination, an elongated member having an inner end, an outer end, a first open notch defined on said inner end for loosely receiving the bow, a second open notch defined on said outer end for releasably engaging the bow string, said elongated member being held in position between the bow and the bow string, respectively, solely by the compressive force exerted on said member by the bow string to releasably maintain the bow flexed and the bow string in a partially drawn condition, drawing of the bow string to the fully drawn condition removing said compressive force permitting said elongated member to fall to the ground, and wherein said elongated member includes a substantially linear portion adjacent said inner end, a pair of spaced fingers extending from said elongated member outer end transversely disposed to said linear portion, said second notch being defined on said fingers, said fingers being sufficiently spaced from each other to receive the nock of an arrow therebetween and permit the archer access to the portion of the bow string intermediate said fingers.

5,065,731

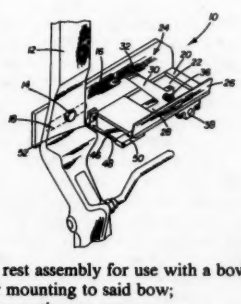
ARROW REST ASSEMBLY

Bill Smith, Talcum, Ky., assignor to Smith Brothers Archery Accessories, Inc, Leburn, Ky.

Filed Jul. 23, 1990, Ser. No. 555,836

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—44.5 **12 Claims**



1. An arrow rest assembly for use with a bow, comprising:

a bracket for mounting to said bow;

arm means for seating an arrow;

support means connected to said bracket for supporting and positioning said arm means;

means for laterally adjusting and securely positioning said arm means on said support means; and

means for incrementally angularly adjusting the position of said arm means about a pivot axis coincident with the axis of said support means,

said means for incrementally angular adjusting being set apart from said support means and being operable to cause angular displacement of said arm means during movement thereof,

whereby said arrow is laterally positioned relative to said bow and its flight trajectory is established through incremental angular adjustment in preparation for shooting said arrow.

5,065,732

BOW SLING

Scott D. Smith, 2400 E. Chicago Rd., Jonesville, Mich. 49250

Filed Jun. 29, 1990, Ser. No. 545,543

Int. Cl.[5] F41B *5/00*

U.S. Cl. 124—88 **10 Claims**

1. A bow sling for attachment to an archery bow having a hand grip, a pair of limbs extending from the hand grip in opposite directions having ends, and a bow string extending between the ends of the limbs, comprising, in combination, an elongated strap formed of elastomeric material, said strap having a pair of integral, elongated legs extending from a first end adapted to be attached to the bow's limbs and a second end having fastening means adapted to be anchored with respect to the archer such that said strap extends over the shoulder of the archer's bow holding arm to support the bow in front of the archer, the elasticity of the strap material permitting the strap to automatically accommodate itself to a length necessary to permit the archer to raise and draw the bow to a firing position and bias the hand grip against the archer's palm.

5,065,733

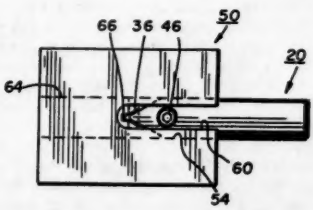
DRESSING TOOL FOR FORM DRESSING OF A GRINDING WHEEL

Henry F. Swenson, 22 Homehill La., Roseland, N.J. 07068

Filed Jan. 8, 1991, Ser. No. 638,540

Int. Cl.[5] B24B *53/12*

U.S. Cl. 125—39 **7 Claims**



7. In combination, a dressing tool and detachable centering gage for use in the form dressing of a cylindrical grinding wheel, said combination comprising:

(a) a dressing tool adapted for clamping and holding a chisel-edge diamond said dressing tool including:

(a1) an elongated cylindrical body having a first end, a second end, and a central axis, said second end adapted for holding said dressing tool in a dressing tool holder of a wheel dressing apparatus;

(a2) said first end having a pair of diametrically opposed flats there-on, said flats being disposed with a predetermined included angle there-between, said predetermined included angle being symmetrically arrayed about said central axis, an open groove transversely connecting each of said flats, said open groove being substantially at ninety degrees with respect to said flats while simultaneously at a selected angle with respect to said central axis, said groove having a selected configuration and depth for insertion, seating, and holding of a chisel edged diamond at said selected disposition with respect to said central axis, said chisel-edge diamond having at least three sides, said selected configuration of said open groove including two substantially parallel side walls and a bottom wall, said bottom wall being disposed at an acute angle with respect to at least one of said side walls, said acute angle adapted for providing a substantially point contact with one abutting side of said chisel-edge diamond while said side walls are adapted for said holding;

(a3) a clamping means adapted for clamping and holding said chisel-edge diamond in said open groove at said selected disposition, said clamping means including a sawcut formed at the bottom of said open groove, said sawcut being of a selected length and extending from one corner of said groove while having a substantially parallel alignment with said sidewall, and a threaded fastener selectively positioned along the length of said sawcut, said fastener adapted for providing said clamping as and when said fastener is tightened;

(b) a detachable centering gage being adapted to removably fit onto said first end of said dressing tool as and when desired, said centering gage including:

(b1) a block portion having a first aperture formed therin, said first aperture having a selected depth from one end of said block portion, said first aperture being sized for a close sliding fit onto said first end of said cylindrical body;

(b2) an elongated slotted aperture extending for a selected length from said one end of said block portion, said elongated slotted aperture being of sufficient depth for connecting one side of said block portion with said first aperture, said elongated aperture being disposed in a substantially centered alignment with said first aperture; and

(b3) a centering groove being of a selected depth and width, said centering groove being formed at the bottom of said first aperture, said centering groove being disposed for providing a centered alignment of a leading edge of said chisel-edge diamond while simultaneously providing a negative angle for a trailing edge of said chisel edge diamond as and when said dressing tool is seated therein, said elongated aperture allowing for the tightening of said threaded fastener after said centering of said chisel-edge diamond with said central axis.

5,065,734

PORTABLE CONVERTIBLE BARBEQUE GRILL

Bernard Elliott, 4146 Edgemere Ct., Apt. D-3, Indianapolis, Ind. 46205

Filed Dec. 17, 1990, Ser. No. 628,144

Int. Cl.[5] F24C *1/16*

U.S. Cl. 126—9 R **20 Claims**

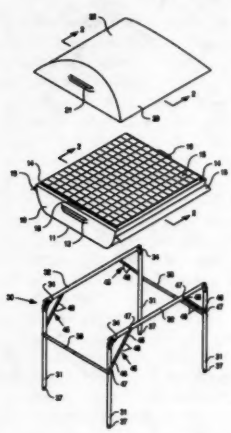
1. Portable convertible barbeque grill, comprising:

a foldable stand having two oppositely disposed parallel horizontal members;

a generally rectangular pan having a flattened bottom, at least two integral pan handles, each disposed along the exterior of a shorter wall of said pan, two horizontal parallel integral interior lips, each disposed longitudinally along the interior of a longer wall of said pan, and two horizontal parallel integral exterior lips, each disposed longitudinally along the exterior of a longer wall of said pan so that said exterior lips are capable of removably

resting on said horizontal members so as to provide support to said pan;

a generally rectangular cover having at least two integral cover handles, each disposed along the exterior of a shorter wall of said cover, said cover having interior dimensions slightly larger than the exterior dimensions of



said pan so that said cover may be disposed to removably fit over said pan; and

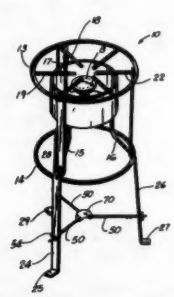
food support means, having dimensions slightly smaller than the interior dimensions of said pan so that said food support means is capable of removably resting on said interior lips.

5,065,735

CONVERTIBLE BURNER APPARATUS

Norman R. Bourgeois, and Bradley A. Robichaux, both of Kenner, La., assignors to Metal Fusion, Inc., Kenner, La.

Filed Sep. 5, 1990, Ser. No. 577,895
Int. Cl.[5] F24C *3/08*
U.S. Cl. 126—40 **9 Claims**



1. A convertible burner apparatus comprising:

a) a primary burner frame that includes upper and lower generally parallel rings and a plurality of struts connecting the rings and supporting the upper ring a distance above the lower ring, the lower ring defining a base for bearing against a flat underlying surface during use;

b) a burner element having influent connection means for removably connecting a source of fuel gas to the burner element;

c) a plurality of radially spaced grate members positioned adjacent the upper ring for supporting a pot during use;

d) a plurality of elongated legs each substantially taller than the primary burner frame and removably connectable to the primary burner frame, for supporting the primary burner frame in an elevated position, and wherein the legs each include feet for bearing against a flat underlying surface during use;

e) connection means for removably affixing each leg to the primary burner frame at positions respectively adjacent the upper and lower rings and including an upper removable connection of the top portion of each leg to the upper portion of the burner frame, and a lower removable connection of the middle portion of the leg to the lower end portion of the burner frame; and

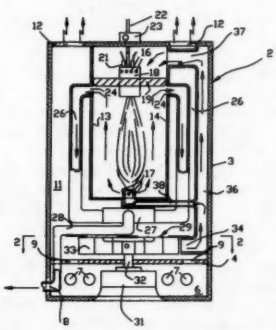
f) means for preventing lateral movement of the legs at a position below the lower ring.

5,065,736

AIR HEATING APPARATUS AND METHOD OF HEATING AN AIR STREAM

Paul A. Mutchler, University, Mo., assignor to Engineered Air Systems, Inc., St. Louis, Mo.

Filed Feb. 1, 1991, Ser. No. 649,429
Int. Cl.[5] F24H *3/02*
U.S. Cl. 126—110 B **16 Claims**



1. An improved air heating apparatus comprising: a longitudinally extending outer housing having spaced air inlet and air outlet means; a combustion drum disposed within said outer housing, said drum including air intake openings at spaced positions relative each other in said drum for introduction of combustion air into said drum through such spaced positions, said drum being sized and shaped to define a longitudinally extending flow-through passage between said drum and said outer housing; burner means disposed within said drum in communication with one of said combustion air inlet openings at said spaced positions in said drum to enhance combustibility within said combustion drum with said introduction of air into said drum through said air intake openings at said spaced positions in said drum, creating a narrow flame extending along the substantial length of said drum with combustion gases flowing along the substantial length of the drum wall to heat said drum wall with at least one combustion as outlet in said drum; at least one combustion gas outlet in said outer housing; heat exchange means disposed to extend along said flowthrough passage defined by said spaced drum and said outer housing along the substantial length of said drum, said heat exchange means being communicatively connected to both said combustion gas outlet in said drum and said combustion gas outlet in said outer housing; and blower means cooperatively positioned with respect to said outer housing to move air through said air intake openings at said spaced positions in said combustion drum to support combustibility with said narrow flame of combustion extending along the substantial length of said drum, said blower means further moving air between said drum and said outer housing over the substantial length of said of heat exchanger to efficiently warm such air by the substantial length of said heat exchanger means and the

substantial length of the outer surface of said heated drum wall of said combustion drum.

5,065,737

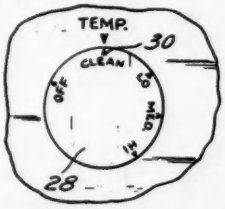
APPARATUS AND METHOD FOR CLEANING A GAS RANGE BURNER

Ernest C. Mieble, 1125 Deborah Dr., Costa Mesa, Calif. 92626

Continuation of Ser. No. 19,743, Feb. 27, 1987, abandoned. This application Apr. 26, 1988, Ser. No. 188,060

Int. Cl.[5] F02B *53/04*

U.S. Cl. 126—214 R 27 Claims



1. A method of cleaning a gas range burner in which food oils and particulates are removed from the burner via slow incineration, said method comprising the steps of:

(a) removing any substantial obstruction from the vicinity of a gas range burner that is to be cleaned; and

(b) providing an amount of gas flow to the burner sufficient to produce a flame directly adjacent the burner and to directly heat the burner to a temperature sufficient to slowly incinerate any food oils and particulates present on the burner, the flame being provided until substantially all the food oils and particulates on the burner have been incinerated.

5,065,738

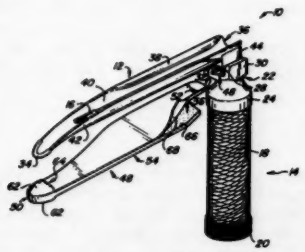
LARYNGOSCOPE BLADE SHEATH

David J. Van Dam, 2464 Kimberly Fair, Rochester Hills, Mich. 48309

Filed Jan. 16, 1990, Ser. No. 465,989

Int. Cl.[5] A61B *1/26*

U.S. Cl. 128—11 10 Claims



1. A laryngoscope blade sheath for covering at least one surface side of a laryngo-scope blade having a tip, a pivot end, opposite transverse edges, an upper surface, and an undersurface, and being transversely arcuate, generally curving from one edge of the blade to the other, the sheath comprising:

a substantially flat, planar, pliable sheet having a generally uniform thickness over substantial portions thereof and an added thickness over at least one portion thereof, said sheet having a tip end, a butt end, and an exposed surface, said exposed surface being contoured according to said at least one portion of said sheet having additional thickness to said uniform thickness;

means disposed at said tip end for capturing the tip of a laryngoscope blade; and

an adhesive surface for adhering said sheath to the upper surface of a laryngoscope blade white adapted for leaving the undersurface of the laryngoscope blade substantially uncovered by said blade sheath.

5,065,739

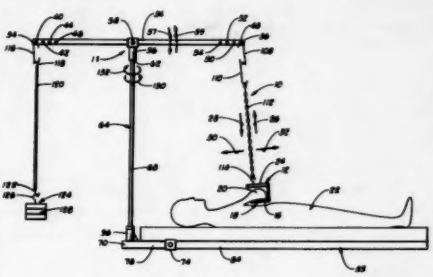
RETRACTOR SUPPORT ASSEMBLY

William J. Forrest, 3400 NW. Expressway, Oklahoma City, Okla. 73112, and Lewis C. Taylor, 1605 Norwood Pl., Oklahoma City, Okla. 73120

Filed Aug. 24, 1989, Ser. No. 398,169

Int. Cl.[5] A61B *17/02*

U.S. Cl. 128—20 9 Claims



1. A retractor support assembly for assisting a surgeon by supporting a portion of a breast of a patient during reconstructive surgery, comprising:

a retractor having a blade which is insertable through a wound near the breast, the blade being insertable through the wound and under a portion of the breast; and

a retractor support means connected to the blade of the retractor for exerting a predetermined force on the retractor tending to pull the retractor a predetermined distance in a generally upwardly direction for lifting the portion of the breast supported on the blade of the retractor and moving the blade and the portion of the breast supported on the blade in the generally upwardly direction the predetermined distance toward a breast lifted position, the retractor support means cooperating to maintain traction on the retractor for supporting the retractor and the portion of the breast supported on the blade of the retractor in the breast lifted position, comprising:

rocking arm means;

means for flexibly connecting the retractor to the rocking arm means whereby the blade of the retractor and the portion of the breast supported on the blade of the retractor are movable by the surgeon for lifting, lowering, moving in generally a left direction and moving in generally a right direction; and

weight means supported on the rocking arm means for pulling the retractor in generally an upwardly direction and exerting the predetermined force on the retractor to pull the retractor and the portion of the breast supported on the blade of the retractor the predetermined distance in generally the upwardly direction toward the breast lifted position.

5,065,740

ULTRASONIC MEDICAL TREATMENT APPARATUS

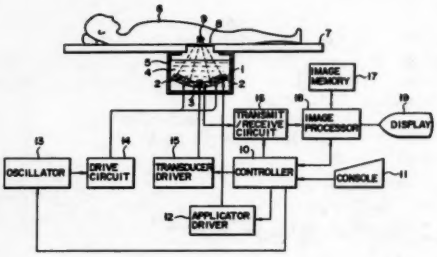
Ayao Itoh, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 137,435, Dec. 23, 1987, abandoned. This application Jul. 23, 1990, Ser. No. 555,826

Claims priority, application Japan, Dec. 26, 1986, 61-315594

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 EL 5 Claims



1. An ultrasonic medical treatment apparatus comprising:

ultrasonic transistor means having a plurality of transducers arranged in a circuit, for radiating and focusing strong ultrasonic waves on a region of interest within an object to be treated;

image ultrasonic transducer means surrounded by said plurality of transducers, for providing tomographic image data representing a plurality of tomographic planes of the region of interest so than an operator can recognize the tomograms as a three-dimensional image data, said tomographic image data representing a plurality of tomograms of B-mode representing a first tomographic plane of the object in a direction of strong ultrasonic wave propagation and a plurality of tomograms of C-mode representing a second tomographic plane of the object in a direction perpendicular to the first tomographic plane;

means connected to said image ultrasonic transducer means, for mechanically moving said image ultrasonic transducer means;

control means connected to said image ultrasonic transducer means, for processing the tomographic image data supplied from said image ultrasonic transducer means and for detecting a position data corresponding to the region of interest within an object by scanning said image ultrasonic transducer means;

image memory means, connected to said control means for storing the tomographic image data and the position data from said control means;

image processing means connected to said control means and said image memory means and for processing the image data and the position data and for reconstructing the plurality of tomograms of C-mode in a direction perpendicular to the tomograms of B-mode; and

display means connected to said image processing means for displaying a plurality of said tomographic image data and said position data read out from said image memory means so that an operator can recognize the three-dimensional image data from the tomograms dispelled thereon.

5,065,741

EXTRACOPOREAL ULTRASONIC LITHOTRIPTER WITH A VARIABLE FOCUS

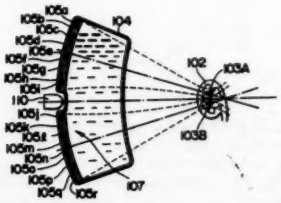
Naoki Uchiyama; Takashi Tsukaya; Kouichiro Ishihara; Sakae Takehana; Tetsumaru Kubota; Syuichi Takayama; Akira Taniguchi; Nobuhiko Watanabe; Naomi Sekino; Hiroki Hibino, and Masaaki Hayashi, all of Hachioji, Japan, assignors to Olympus Optical Co. Ltd., Japan

Division of Ser. No. 182,785, Apr. 18, 1988, Pat. No. 4,984,575. This application Jan. 9, 1991, Ser. No. 639,922

Claims priority, application Japan, Apr. 16, 1987, 62-94870; Apr. 17, 1987, 62-94583; Apr. 25, 1987, 62-102809; Apr. 27, 1987, 62-102071; Apr. 28, 1987, 62-105637; May 20, 1987, 62-124838; Jun. 18, 1987, 62-152777; Jun. 19, 1987, 62-153163; Jun. 22, 1987, 62-155749

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 EL 7 Claims



1. An extracorporeal therapeutic apparatus, comprising:

a locating system for locating a calculus within a patient by utilizing X-rays or ultrasonic waves;

shock wave generating means for generating a shock wave for therapeutically treating said calculus;

focusing means for focusing said shock wave upon said calculus;

positioning means for positioning said locating system and said shock wave generating means at desired positions with respect to said patient;

a shock wave generator including a plurality of ultrasonic vibrators located on a spherical surface in a mosaic pattern;

an ultrasonic probe for scanning and detecting said calculus;

means for determining the distance to said calculus and for calculating the desired focal length of said shock wave; and

selecting means for selecting some of said ultrasonic vibrators to be driven as a function of said desired focal length.

5,065,742

ULTRASONIC WAVE COUPLER FOR LOCATING TRANSDUCER IN A LITHOTRIPTIC APPARATUS

Thomas Belikan, and Werner Krauss, both of Knittlingen, Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed May 29, 1990, Ser. No. 529,975

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1989, 3922641

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 EL 11 Claims

1. A coupler for an ultrasonic locating transducer used in a lithotriptic apparatus, said coupler comprising a body having a first side which has a shape adapted to contact a patient's skin and a second side adapted to releasably fit the sound head of an ultrasonic locating transducer so as to allow ultrasonic waves from an ultrasonic locating transducer to be coupled into a patient without losses, said body consisting essentially of a material which is dimensionally stable and which has a characteristic wave impedance substantially the same as that of a

patient's body tissue, and said coupler body further comprising means for securely and releasably seating the coupler on the

ultrasonic locating transducer said coupler body and means for seating being constructed of one piece.

5,065,743

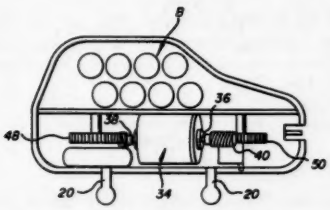
KNEADER

W. Don Sutherland, R.R. #2, Glenbow Road, Cochrane, Alberta, T0L 0W0, Canada

Continuation-in-part of Ser. No. 208,944, Jun. 20, 1988, Pat. No. 4,920,957. This application Apr. 30, 1990, Ser. No. 516,986

Int. Cl.[5] A61H *7/00*

U.S. Cl. 128—60 **13 Claims**



6. A massage device comprising:

(a) casing means having a top and a bottom, an inner chamber and an opening in the bottom to said inner chamber;

(b) said chamber including inner walls;

(c) motor means positioned in said chamber;

(d) said chamber including guide means extending at least along one of said inner walls of said casing means;

(e) at least one pair of massaging means mounted on said guide means and extending outwardly from said opening;

(f) means for mounting each of said massaging means for reciprocal movement with respect to each other and said guide means;

(g) drive means associated with said motor means and connected to said pair of massaging means for reciprocally driving each of said massaging means relative to said guide means, and to each other;

(h) said drive means associated with said motor means and driven by said motor means for reciprocally driving each of said massaging means;

(i) said drive means include first gear means, second gear means, and linking means;

(j) said first gear means is rotatable about a first axis by said motor means and engages said second gear means;

(k) said second gear means is rotatable by said first gear means about a second axis;

(l) said linking means is connected to said second gear means and spaced from said second axis for rotational movement about said second axis;

(m) said linking means engages said massaging means for transferring rotational movement from said second gear means to said massaging means; and

(n) said massaging means has located therein slot means for converting the rotational movement of said linking means to linear reciprocating movement of said massaging means.

5,065,744

DEVICE FOR TREATMENT OF SEXUAL IMPOTENCE IN HUMAN MALES

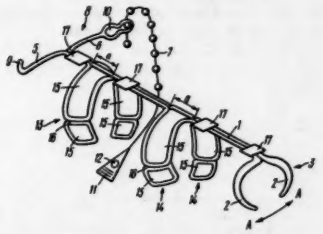
Zinovy A. Zusmanovsky, 5 Sovetskaya ulitsa, 34, kv. 42, Leningrad, U.S.S.R.

PCT No. PCT/SU89/00165, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/15583, PCT Pub. Date Dec. 27, 1990

PCT Filed Jun. 16, 1989, Ser. No. 678,284

Int. Cl.[5] A61F *5/00, 6/02*

U.S. Cl. 128—79 **4 Claims**



1. A device for treatment of sexual impotence in human males, comprising two parallel pivotally mounted interconnected rods (1), a first set of ends of said rods which are rigidly connected respectively to arcuate members (2) curved towards each other so as to form a glans penis retainer (3), while the other ends of said rods are also rigidly connected to the respective arcuate members (5, 6) curved towards each other so as to establish a penile base retainer (8), while free ends of said members are interconnected through an adjustable-length elastic bundle (7), said rods (1) forming at least two control loops (13) curved towards each other and located close to the penile base retainer (8) so as to encompass the penis at its base, characterized in that the parallel pivotally mounted rods (1) form at least two stimulating loops (14) curved towards each other and located in the penile active zone.

5,065,745

PORTABLE RESPIRATORY PROTECTION DEVICE

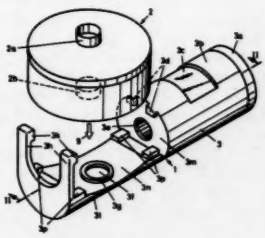
Peter Meier, Lindau, Switzerland, assignor to Micronel AG, Switzerland

Filed Sep. 19, 1990, Ser. No. 584,593

Claims priority, application Switzerland, Sep. 29, 1989, 3541/89

Int. Cl.[5] A62B *7/10, 23/02*

U.S. Cl. 128—205.12 **16 Claims**



1. A portable positive pressure filtered air respiratory protection device including a housing having a shell, an air canister filter having an inlet and an outlet detachably mounted on said housing, a suction opening formed in said housing shell essentially covered by said canister filter, but including spaces between said canister filter and said housing so that ambient air can flow to said suction opening, a blower located in said housing for drawing ambient air into said housing for passage

to said canister filter, channel means formed in said housing for connecting said canister filter with said suction opening, said housing partially enclosing and supporting said canister filter and having a connection opening in communication with said canister filter inlet and said channel means extending between said connection opening and said blower, and means on the exterior of said housing shell for holding said canister filter on said housing.

5,065,746

EXPIRATION VALVE CONTROL ARRANGEMENT FOR A VENTILATING APPARATUS

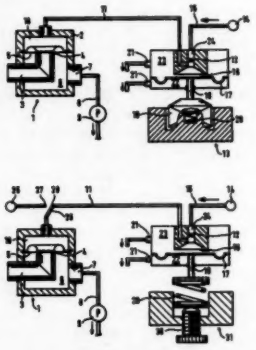
Hans-Wilhelm Steen, Zarpen, Fed. Rep. of Germany, assignor to Drägerwerk, Lübeck, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 374,065

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1988, 3822949

Int. Cl.[5] A62B *9/02;* **A61M** *16/00*

U.S. Cl. 128—205.24 **11 Claims**



1. An expiration valve control arrangement for a ventilating apparatus having an expiration branch line, said expiration branch line producing dynamic flow resistance as the exhaled breathing gas flows therethrough, said dynamic flow resistance producing dynamic positive end expiratory pressure in the expiration branch line, the arrangement comprising:

an expiration valve having an expiration valve housing and membrane valve means for partitioning said housing into a control chamber and a valve chamber;

an inlet for admitting exhaled breathing gas into said valve chamber;

said membrane valve means being movable so as to close said inlet during inspiration and open said inlet during expiration so as to cause said inlet to communicate with said valve chamber;

means for compensating for said dynamic positive end expiratory pressure comprising;

control valve for generating a control pressure for maintaining a desired end expiratory pressure during expiration in said control chamber of said expiration valve, said control valve including a control valve housing and a plate membrane for partitioning said control valve housing into first and second chambers;

control gas supply means for supplying a control gas under pressure;

feed means for conducting said control gas into said control valve;

said control valve including valve seat means disposed in said first chamber and communicating with said feed means;

said plate membrane being mounted in said control valve housing for coacting with said valve seat means for opening and closing said valve seat means to said first chamber;

said feed means including throttle means disposed between said supply means and said valve seat means for throttling the flow of said control gas

a conduit connecting said throttle means to said control chamber of said expiration valve for transmitting said control gas to said control chamber;

underpressure means for generating an underpressure in said valve chamber of said expiration valve corresponding to said dynamic positive end expiratory pressure; and,

said control valve further including force applying means for applying a first force to said plate membrane during said inspiration for closing said valve seat means to said first chamber thereby causing the control gas flowing from said throttle means to produce an overpressure in said control chamber causing said membrane valve means of said expiration valve to close and for applying a second force to said control membrane during said expiration for opening said valve seat means to said first chamber, and said force applying means coating with said throttle means to adjust said desired end expiratory pressure in said control chamber causing said membrane valve means to open and permit exhalation, said second force being less than said first force and being adjustable to set said desired end expiratory pressure in said control chamber to compensate for said dynamic positive end expiratory pressure in the expiration branch line.

5,065,747

METHOD FOR IMPROVING THE ACCURACY OF DIAGNOSIS OF GROWTH HORMONE DEFICIENCY

Barry B. Bercu, Tampa, Fla., assignor to University of South Florida, Tampa, Fla.

Filed Nov. 21, 1989, Ser. No. 439,407

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—630 **14 Claims**

1. A method for improving the diagnosis of individuals having growth hormone deficiency, comprising the steps of administering to the individual a predetermined amount of somatostatin for a predetermined amount of time at a predetermined rate to establish a definite growth hormone secretory trough and following said step with a provocative test, said provocative test being of the type that acts on the hypothalamus and causes it to provoke the pituitary to produce growth hormone.

5,065,748

METHOD OF DIAGNOSING GROWTH HORMONE DISORDERS EMPLOYING SOMATOSTATIN AND GROWTH HORMONE RELEASING HORMONE

Barry B. Bercu, Tampa, Fla., assignor to University of South Florida, Tampa, Fla.

Filed Nov. 14, 1989, Ser. No. 437,041

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—630 **16 Claims**

1. A method of diagnosing growth hormone deficiency and neurosecretory dysfunction, comprising the steps of:

inhibiting secretion by the pituitary gland of growth hormone by administering to a patient a predetermined dosage of somatostatin;

following said administration by a continuing administration of somatostatin for a predetermined period of time and discontinuing the administration of the somatostatin at the end of said predetermined period of time;

stimulating secretion by the pituitary gland of growth hormone by administering to the patient a predetermined dosage of growth hormone releasing hormone at a predetermined time after the administration of the somatostatin has been discontinued;

monitoring the concentration of growth hormone in the

bloodstream of the individual at predetermined intervals of time throughout the performance of the method; and

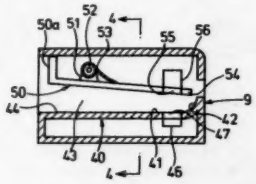
classifying the individual as having a growth hormone deficiency or a neurosecretory dysfunction based upon the individual's response to the procedure.

5,065,749

FINGERTIP PULSE WAVE SENSOR

Noboru Hasebe, and Shoji Ito, both of Tokyo, Japan, assignors to Misawa Homes Institute of Research & Development, Tokyo, Japan

Continuation of Ser. No. 329,579, Mar. 28, 1989, Pat. No. 4,971,062. This application Aug. 31, 1990, Ser. No. 576,696
Claims priority, application Japan, Sep. 24, 1988, 63-237535
Int. Cl.[5] A61B *6/00*
U.S. Cl. 128—664 **4 Claims**



1. A fingertip pulse wave sensor, comprising:

a casing;

a fingertip cushion supporting member fixed relative to said casing and having a fingertip cushion supporting surface;

a nail supporting member having a forward portion and a rearward portion adjacent to the forward portion, the nail supporting member being hinged to said casing and having a nail supporting surface which is disposed in opposed relationship with said fingertip cushion supporting surface at a distance smaller than the standard thickness of fingertips;

an elastic means for urging said hinged nail supporting member toward said fingertip cushion supporting surface in such a manner that the pressure applied by said elastic means becomes substantially constant with respect to the variations in the pivot stroke caused by the variations in the thickness of said fingertips resting on said fingertip cushion supporting member;

a light-emitting element disposed on one of said nail supporting surface at the forward portion thereof and said fingertip cushion supporting surface; and

a light-receiving element disposed on the other of said nail supporting surface at the forward portion thereof and said fingertip cushion supporting surface;

the nail supporting surface being hinged to the casing at a point situated rearwardly of one of the light-emitting element and the light-receiving element disposed thereon.

5,065,750

MANIPULATIVE SKILL TESTING APPARATUS

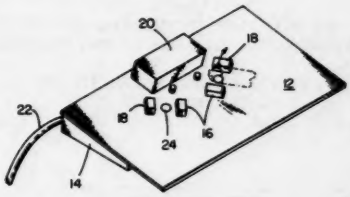
Robert L. Maxwell, 17777 Palatine Ave. North, Seattle, Wash. 98133

Filed Apr. 20, 1990, Ser. No. 511,456
Int. Cl.[5] A61B *13/00*
U.S. Cl. 128—745 **5 Claims**

1. A diagnostic testing device comprising;

platform means for supporting a pair of human appendages whereby the appendages are free to move,

means mounted directly to the platform means to generate a signal in response to repetitive movement of each appendage, said means being responsive to the rapidity of movement and sequence of movement during the movement of the appendage, and



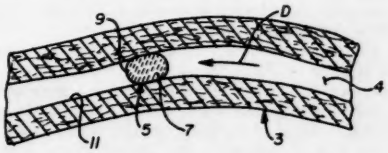
means to record the signals generated by said movement whereby the respective movements may be analyzed and compared for the determination of brain function.

5,065,751

METHOD AND APPARATUS FOR REVERSIBLY OCCLUDING A BIOLOGICAL TUBE

Gerald L. Wolf, 100 Denniston St. #77, Pittsburgh, Pa. 15206-4043

Division of Ser. No. 460,314, Jan. 3, 1990, Pat. No. 4,983,177. This application Sep. 28, 1990, Ser. No. 589,769
Int. Cl.[5] A61F *6/06, 6/02*
U.S. Cl. 128—831 **5 Claims**



1. A method of forming an occlusion member in a biological tube reversibly blocking passage of material through said tube, including the steps of:

selecting a material fragmentable by shock wave;

establishing said occlusion member in said tube by introducing said material into said tube in flowable form; and

allowing said material to harden in situ thereby occluding said tube.

5,065,752

HYDROPHILIC FOAM COMPOSITIONS

Robert W. Sessions, Hindsdale, and Roy D. Carr, Burr Ridge, both of Ill., assignors to Ferris Mfg. Co., Burr Ridge, Ill.

Division of Ser. No. 175,036, Mar. 29, 1988. This application May 28, 1991, Ser. No. 705,938
Int. Cl.[5] A61L *15/00, 15/16*
U.S. Cl. 128—156 **10 Claims**

1. A composite for use in a wound dressing comprising a substrate, a medically acceptable adhesive deposited on said substrate and a hydrophilic foam composition carried by said adhesive, said composition comprising the in situ reaction product of:

(a) an isocyanate-capped polyether prepolymer,

(b) a polymeric hydrophilic agent capable of absorbing water,

(c) an adjuvant comprising an alcohol selected from the group consisting of water soluble monols, diols and polyhydric alcohols,

(d) a wetting agent, and

(e) water, said hydrophilic foam composition releasably carrying said adjuvant so that said foam composition is capable of absorbing an external liquid and tightly carrying said liquid in preference to at least a portion of said

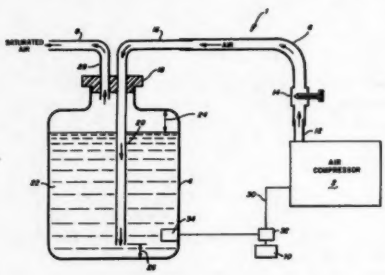
adjuvant so that said adjuvant is released in the presence of the external liquid.

5,065,753

AIR-MOISTURE GENERATION SYSTEM

Calvin Kalishman, 7034 Arbor View La., New Port Richey, Fla. 34653

Filed May 4, 1990, Ser. No. 519,157
Int. Cl.[5] A61M *16/10, 15/00*
U.S. Cl. 128—200.11 4 Claims



1. An air-moisture generation system comprising:

a tank for holding a quantity of liquid and having an air inlet and an air outlet means,

said air inlet means to said tank having a rigid tube extending into said tank and terminating in an outlet at a level spaced from the bottom of said tank,

an air compressor means for providing a source of compressed air to said air inlet means,

a switch means located within said tank in a predetermined position with respect to the outlet of said rigid tube which disables said air compressor means when the liquid level falls to a selected level with respect to the rigid tube outlet,

a metering valve in said air inlet means for controlling the volume of air flowing from said air compressor means into said tank, whereby air under controlled pressure and volume is passed through the liquid in the tank to provide liquid saturated air in the tank,

said tank having the liquid therein occupying less than the entire volume of the tank to leave a space above the liquid level in which the liquid saturated air is formed,

and said saturated air is forced out of the outlet means to provide a positive pressure stream of saturated air.

5,065,754

ASPIRATING CATHETER TUBE INSERTER

Billy M. Jensen, Sandy, Utah, assignor to Ballard Medical Products, Draper, Utah

Filed Jun. 6, 1990, Ser. No. 534,079
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—200.26 13 Claims

1. An inserter for placement of a distal end of an aspirating catheter tube at a desired lung site, the inserter comprising:

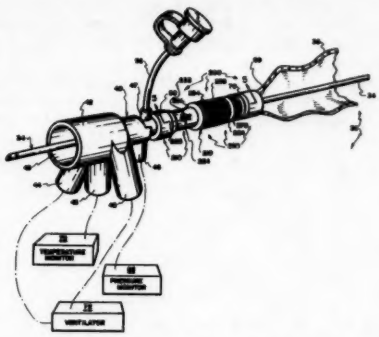
first tube inserting housing means through which the catheter tube reciprocably extends;

first elastomeric means associated with the first tube inserting housing means and comprising aperture means of a diametral size less than the diameter of the catheter tube resiliently compressively engaging the catheter tube at a first site;

second tube inserting housing means reciprocably associated with the first tube inserting housing means and through which the catheter tube reciprocably extends;

second elastomeric means associated with the second tube inserting housing means and comprising aperture means of a diametral size less than the diameter of the catheter tube resiliently compressively engaging the catheter tube at a second site;

whereby manual distally directed displacement of the second tube inserting housing means in respect to the first tube inserting housing means causes the aperture means of the second elastomeric means to grippingly distally advance the catheter tube and the aperture means of the first elastomeric means to exert a displacement controlling



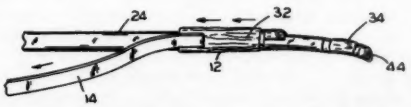
drag upon the distally advancing catheter tube and manual proximally directed displacement of the second tube inserting housing means in respect to the first housing tube inserting means accommodates holding by the aperture means of the first elastomeric means to hold the catheter tube against material displacement as the aperture means of the second means is displaced proximally along the catheter tube site.

5,065,755

PROTECTIVE SHEATH FOR CUFF OR SINGLE OR DOUBLE LUMEN ENDOTRACHEAL TUBE

Jerome M. Klafta, 211 E. Ohio, Apt. 1412, Chicago, Ill. 60611

Filed Nov. 29, 1989, Ser. No. 442,852
Int. Cl.[5] A61M *16/00*
U.S. Cl. 128—200.26 19 Claims



1. In combination, a non-resilient protective sheath for an endotracheal tube, said sheath having a continuously cylindrical body and being manually positioned onto said endotracheal tube and covering a cuff of said endotracheal tube during insertion of said endotracheal tube into a patient; said sheath being removable from said endotracheal tube after insertion of said endotracheal tube into said patient; a retrieval member extending along the length of said endotracheal tube and attached to said sheath, whereby said sheath is removable from said cuff by means of said retrieval member after proper insertion of said endotracheal tube into said patient.

5,065,756

METHOD AND APPARATUS FOR THE TREATMENT OF OBSTRUCTIVE SLEEP APNEA

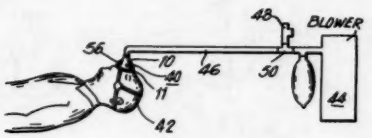
David M. Rapoport, New York, N.Y., assignor to New York University, New York, N.Y.

Filed Dec. 22, 1987, Ser. No. 136,293
Int. Cl.[5] A62B *18/02*
U.S. Cl. 128—204.18 7 Claims

1. An assembly for treatment of obstructive sleep apnea comprising:

a nose mask adapted to be fitted over the nose of a patient;

supply means coupled to said mask for supplying air with continuous positive pressure to said mask suited to maintain the nasopharynegeal airway of a patient open when said supply means is supplied with gas at positive pressure, said supply means comprising an elongated flexible tube coupled at one end to said mask and having an opposite and remote from said mask that is connected to inlet means for receiving pressurized air and delivering air to



said flexible tube to establish within the mask a predetermined range of pressures;

venting means located on the nose mask for continuously venting patient expiratory flow while said positive pressure is applied to said mask via said supply means; and

a threshold valve mounted at said opposite end of the flexible tube and adjustable for maintaining a positive pressure within said mask in the range of about 5 to 15 centimeters water at all times when said mask is fitted over the nose of a patient for respiration.

5,065,757

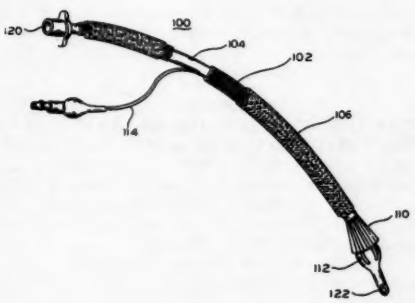
SHIELDING TO PROTECT MATERIAL FROM LASER LIGHT

Branislav M. Dragisic, 700 Valley Rd., Itasca, Ill. 60143, and Finley W. Markley, 918 Horne St., St. Charles, Ill. 60174

Continuation of Ser. No. 101,592, Sep. 28, 1987. This application May 16, 1988, Ser. No. 194,315

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.14 **10 Claims**



1. An endotracheal tube comprising:

a tube capable of supplying gas to a patient;

means for protecting said tube from damage by light from a laser, said means including a woven metal shield encircling at least a portion of said tube;

a woven fiberglass shield encircling said woven metal shield;

said woven metal shield and said woven fiberglass shield constituting means for reflecting light from a laser and means for dispersing light from a laser, respectively.

5,065,758

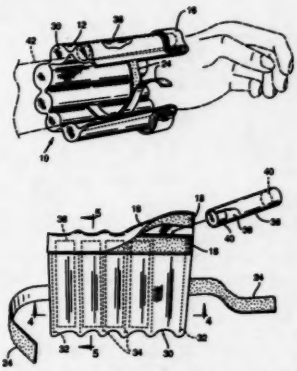
COLD PACK FOR TREATMENT OF INJURIES

James L. Whitehead, 930 S. Davis, McMinnville, Oreg. 97128, and Leland D. Chapman, 65579 E. Alpine Way, Rhododendron, Oreg. 97049

Filed Apr. 10, 1990, Ser. No. 507,300

Int. Cl.[5] A61F *7/00*

U.S. Cl. 128—402 **7 Claims**



1. A cold pack for treating an injured area of a subject person comprising;

a plurality of rigid closed end cylinders, flexible connecting means interconnecting the cylinders in parallel side-by-side relationship, a cooling media characterized by its cooling property when exposed to ambient temperature, said cooling media encased in said plurality of cylinders to thereby provide a wrap of rigid side-by-side cooling media encased cylinders separated by flexible hinges, said rigid cylinders of a designated size and said flexible connecting means providing hinge connections between said rigid cylinders to permit the cold pack to be formed into a curve for wrapping around the injured area of a subject person.

5,065,759

PACEMAKER WITH OPTIMIZED RATE RESPONSIVENESS AND METHOD OF RATE CONTROL

Malcolm J. S. Begemann, Velp; Bernhard de Vries, Dieren, and Johannes S. van der Veen, Arnhem, all of Netherlands, assignors to Vitatron Medical B.V., Dieren, Netherlands

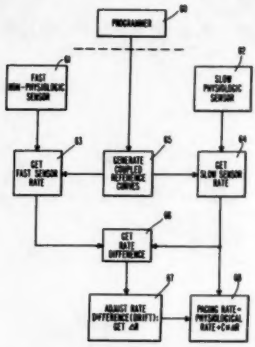
Filed Aug. 30, 1990, Ser. No. 575,289

Int. Cl.[5] A61N *1/365*

U.S. Cl. 128—419.0 PG **49 Claims**

1. A pacing system having rate controllable pulse generator means for generating pacing pulses, first sensor means for developing first signals indicating a first pacing rate, second sensor means for developing second signals indicating a second pacing rate, and rate control means for determining desired pacing rate and controlling the rate of said pulse generator means, said rate means further comprising algorithm means for

determining (a) from each of said first and second sensor means signals a respective indicated direction of rate change and



amount of rate change, and (b) for determining said desired pacing rate as a function of said directions and amounts.

5,065,760

CABLE GUIDE FOR A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

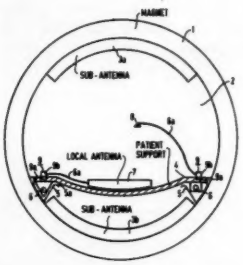
Norbert Krause, Heroldsbach; Wilhelm Hanke, Rueckersdorf, and Juergen Ruhl, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1990, Ser. No. 592,293

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3935082

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653.5 **17 Claims**



1. In a nuclear magnetic resonance tomography apparatus having a magnet with a central opening defining an examination space and having a patient support movable into said examination space, said opening having a wall on which a whole-body antenna divided azimuthally into a plurality of sub-antennas for generating a polarized field is attached, said sub-antennas including a lower sub-antenna disposed beneath said patient support when said patient support is in said examination space, said patient support having a plurality of electrical devices attached thereto and said apparatus having a plurality of further electrical devices disposed-outside of said examination space and connected to said electrical devices on said patient support via cables, the improvement of a cable guide for said cables comprising:

a channel adapted to receive said cables disposed beneath said patient support and above said lower sub-antenna, said cable channel disposed at said wall of said examination space and having rounded edges projecting beyond the height of said lower sub-antenna said cable channel having a shape dependent on said polarized field.

5,065,761

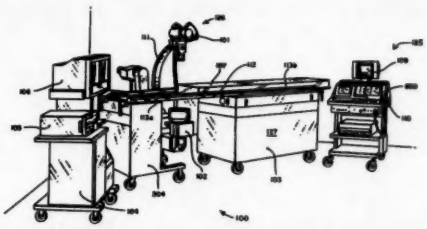
LITHOTRIPSY SYSTEM

James W. Pell, Los Altos, Calif., assignor to Diasonics, Inc., Milpitas, Calif.

Filed Jul. 12, 1989, Ser. No. 379,568

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—660.03 **2 Claims**



1. A lithotripter for contact free shockwave disintegration of stones within the human body comprising:

(1) an x-ray prelocalization means for locating said stones within said human body;

(2) a real time ultrasonic monitoring means for monitoring said stones within said human body after said location has been determined by said x-ray prelocalization means;

(3) a high power generation means for applying a voltage to a focussing lens assembly;

(4) said focussing lens assembly comprising a planar piezoelectric transducer, an acoustical lens coupled to said piezoelectric transducer and a voltage coupling means for coupling said piezoelectric transducer to said high power generation means said acoustical lens defining an ellipsoid having a first focus and a second focus;

(5) a triggering means for pulsing said high power generation means;

(6) a water containment enclosure fixedly attached to said focussing lens assembly on one side and the upper surface of said water containment enclosure opposite said focussing lens assembly on the other side, and said water containment enclosure providing a shockwave propagation medium for said shockwave disintegration of said stones within said human body; and

(7) a moveable planar surface means for supporting said human body, said planar surface means relocateable from said x-ray prelocation means to said real time ultrasonic means, wherein said real time ultrasonic means are located below said the upper surface of said water containment enclosure.

5,065,762

EXTRACORPOREAL LITHOTRIPSY APPARATUS FOR THE DISINTEGRATION OF CALCULI HAVING AN UNATTENUATED LOCATING FIELD

Helmut Iffländer, Spardorf; Eike Matura; Walter Polster, both of Erlangen, and Manfred Rattner, Grossenseebach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 23, 1990, Ser. No. 527,438

Claims priority, application European Pat. Off., Jun. 2, 1989, 89110039

Int. Cl.[5] A61B *17/22*

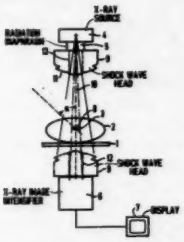
U.S. Cl. 128—660.03 **4 Claims**

1. An extracorporeal lithotripsy apparatus comprising:

means for generating shock waves adapted for non-invasive treatment of calculi in the body of a patient, said means for generating shock waves having a focus at which said shock waves converge;

transmission means for transmitting shock waves from said means for generating shock waves, said transmission means including a propagation medium for said shock

waves in a closed space and having an application surface formed by a flexible cover adapted for pressing against said patient to couple said shock waves into said patient, said transmission means having a central receptacle which is closed at an end by said application surface;



means for generating a radiation field for locating the position of said calculus in said patient disposed behind said means for generating shock waves; and

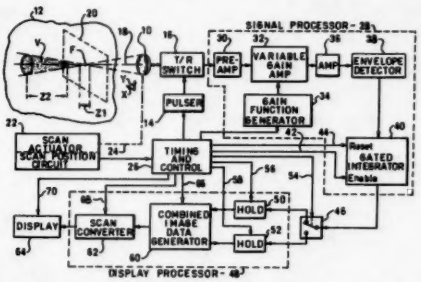
said receptacle being transmissive for said radiation field so that said radiation field is unattenuated by passage therethrough.

5,065,763

COMBINED REFLECTION AND TRANSMSSION UNTRASONIC IMAGING METHOD AND APPARATUS

Philip S. Green, Redwood City; John S. Ostrem, and Todd K. Whitehurst, both of Palo Alto, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Feb. 21, 1990, Ser. No. 483,574
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—660.07 **63 Claims**



1. In an ultrasonic imaging method for non-invasive imaging a section within a subject, steps comprising

transmitting by ultrasonic transducer means an ultrasonic energy pulse into the subject to pulse insonify the same,

receiving by ultrasonic transducer means ultrasonic energy from within the subject,

focusing the ultrasonic transducer means at a focal point within the subject during at least one of the transmitting and receiving steps,

for each pulse insonification of the subject, said receiving step including first receiving energy reflected from the focal point and converting the same to first electrical signals substantially dependent upon reflectivity of ultrasonic energy at the focal point, then receiving energy reflected from a backscatter zone that is opposite the focal point from the transducer means and converting the same to second electrical signals substantially dependent upon attenuation of ultrasonic energy at the focal point,

processing said first and second electrical signals to produce first and second registered pixel signal values that are substantially dependent upon reflectivity and transmissivity, respectively, of the subject at the focal point,

repeating said transmitting, receiving, focusing and processing steps while scanning the section to obtain separate reflection C-scan image data for a reflection image and transmission C-scan image data for a transmission image of the section, and

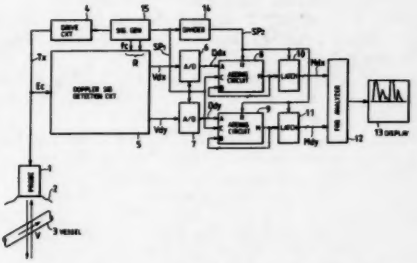
employing both the reflection and transmission image data, generating combined image data for a combined C-scan image which is a function of both the reflection and transmission image data.

5,065,764

ULTRASONIC DOPPLER BLOOD FLOW VELOCITY DETECTION APPARATUS

Yasuhiro Nakamura, Tokyo; Ikuo Sakai, Kawasaki, and Masami Kawabuchi, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 19, 1989, Ser. No. 452,653
Claims priority, application Japan, Dec. 21, 1988, 63-322655
Int. Cl.[5] A61B *8/06*
U.S. Cl. 128—661.09 **6 Claims**



1. An ultrasonic Doppler blood flow velocity detection apparatus comprising:

(a) signal producing means for producing trigger pulses, a sampling clock signal having a given phase relation with said trigger pulses, and a pair of quadrature signals of a given frequency in response to said trigger pulses;

(b) transducing means for transmitting ultrasonic waves in response to said trigger pulses and for receiving ultrasonic waves reflected by an ultrasonic-wave reflective object and converting the received ultrasonic waves into an electric echo signal;

(c) Doppler shift detection means responsive to said pair of quadrature signals and said echo signal for detecting Doppler shift; and

(d) low-pass filter means for removing high frequency components from said Doppler shift by averaging time-different values of said Doppler shift in response to said sampling clock signal and said Doppler shift, thereby producing a signal indicative of flow velocity of said ultrasonic-wave reflective object.

5,065,765

COMPENSATION FOR TONOMETER SENSOR CROSSTALK AND ELEMENT SPACING

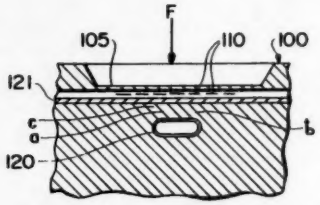
Joseph S. Eckerle, Redwood City, and Roy Kornbluh, Palo Alto, both of Calif., assignors to Colin Electronics Co., Ltd., Japan

Continuation-in-part of Ser. No. 370,308, Jun. 23, 1989, abandoned. This application Jan. 25, 1990, Ser. No. 470,241
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—672 **37 Claims**

1. A method for compensating for crosstalk behavior and element spacing of the sensor of an arterial tonometer instrument, which sensor has a plurality of pressure sensing elements disposed on at least one diaphragm, the method comprising the steps of:

determining a measured artery pressure profile of a superficial artery;

using at least one characteristic of said measured artery pressure profile to determine an error correction factor;



determining an uncorrected blood pressure value; and

calculating a corrected blood pressure value by applying said error correction factor to said uncorrected blood pressure value.

5,065,766

DEVICE FOR DETECTING R-WAVES IN ELECTROCARDIOGRAM

Minoru Sasaki, Yokohama, Japan, assignor to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Japan

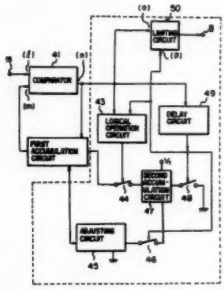
PCT No. PCT/JP85/00448, § 371 Date Apr. 10, 1986, § 102(e) Date Apr. 10, 1986, PCT Pub. No. WO86/01092, PCT Pub. Date Feb. 27, 1986

Division of Ser. No. 855,611, Apr. 10, 1986, abandoned. This PCT application Aug. 12, 1985, Ser. No. 336,540

Claims priority, application Japan, Aug. 11, 1984, 59-167296

Int. Cl.[5] A61B *5/0402*

U.S. Cl. 128—708 **2 Claims**



1. A device for detecting an R-wave in an electrocardiogram comprising:

(a) a filter means for passing frequency components including an R-wave from an electrocardiogram input;

(b) a comparator for outputting an R-wave pulse when an input voltage passed through the filter means is higher than a reference voltage, said comparator having two input terminals, the first of said input terminals being coupled to the filter means so as to receive signals passed through the filter means;

(c) a first accumulation circuit connected to the comparator for accumulating charges output by the comparator and for outputting the reference voltage to the second input terminal of the comparator, the reference voltage being formed by accumulating the R-wave pulse from the comparator and by a predetermined voltage from a second accumulation circuit;

(d) a second accumulation circuit for accumulating the predetermined voltage, including means for connecting said second accumulation circuit to said first accumulation circuit when a digital pulse is output from a logical operation circuit means;

(e) a delay circuit connected to the comparator for converting the R-wave pulse to a delay pulse and for outputting the delay pulse having a predetermined pulse width after the output from the comparator has fallen;

(f) a logical operation circuit means connected to the comparator and the delay circuit for disconnecting the first accumulation circuit and the second accumulation circuit when the R-wave pulse from the comparator is output or when the delay pulse from the delay circuit is output and for connecting the first and second accumulation circuits at any other occasion; and

(g) an adjusting circuit, including means for connection to the second accumulation circuit, connected to the first accumulation circuit for adjusting the voltages of the first and second accumulation circuit when the delay pulse is output from the delay circuit so that the voltage of the first accumulation circuit is lowered by electrically charging or discharging the first and second accumulation circuits.

5,065,767

METHOD FOR USE IN DIAGNOSIS OF GLAUCOMA

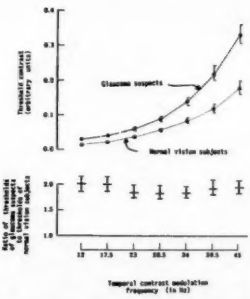
Teddy L. Maddess, Kaleen, Australia, assignor to The Australian National University, Australia

Filed Aug. 25, 1989, Ser. No. 398,593

Claims priority, application Australia, Aug. 26, 1988, PJ0049

Int. Cl.[5] A61B *3/02, 5/00*

U.S. Cl. 128—745 **8 Claims**



1. A method of testing a person to determine the presence of glaucomatous destruction of ganglion cells in a retina of that person, said method comprising the steps of:

(a) monocularly presenting the person with a sinusoidal grating pattern having generally elongate striations, the contrast of the pattern being modulated at a frequency in the range of from about 10 Hz to about 50 Hz, the contrast of the grating pattern being such that the person can observe a frequency-doubled grating pattern;

(b) reducing the contrast of the grating pattern until a contrast value at which the frequency-doubled pattern is no longer observed is attained; and

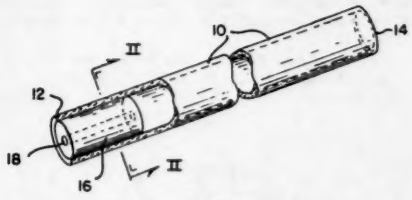
(c) comparing said attained contrast value at which the frequency-doubled pattern is no longer observed with the highest contrast value at which the frequency-doubled pattern is no longer observed by persons of normal vision.

5,065,768

SELF-SEALING FLUID CONDUIT AND COLLECTION DEVICE

Charles M. Coleman, Pittsburgh, and William G. Kendrick, Sr., Doylestown, both of Pa., assignors to Safe-Tec Clinical Products, Inc., Ivyland, Pa.

Filed Sep. 13, 1988, Ser. No. 243,982
Int. Cl.[5] A61B *5/00*
U.S. Cl. 128—760 27 Claims



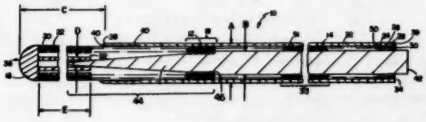
1. A self-sealing tube comprising a tubular body having an elongated bore and a fluid entry end, and a movable plug of super-absorbent containing composite material provided within said tube, said super-absorbent material adapted to expand when contacted by an aqueous fluid and seal said tube to prevent passage of air and liquids through the plug during centrifugation and expulsion.

5,065,769

SMALL DIAMETER GUIDEWIRES OF MULTI-FILAR, CROSS-WOUND COILS

Fernando A. de Toledo, Concord, Mass., assignor to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 276,106, Nov. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 170,514, Mar. 21, 1988, Pat. No. 4,932,419. This application Jan. 18, 1991, Ser. No. 642,543
Int. Cl.[5] A61M *25/00*
U.S. Cl. 128—772 20 Claims



1. A medical guidewire having a distal tip portion for advancement through a body by application of axial force and by application of rotational force to a proximal end portion outside the body, said guidewire comprising:

an elongated cross-wound multi-filar coil structural element, said structural element comprising a first multi-filar coil segment and a second multi-filar coil segment, said first and second multi-filar coil segments disposed adjacent and in close proximity to one another along a portion of the length of said structural element, and

a sheath formed of material that is non-corrosive within the body, said sheath disposed about and along a substantial portion of the length of said structural element, said sheath being adapted to flex in unison with said structural element without kinking,

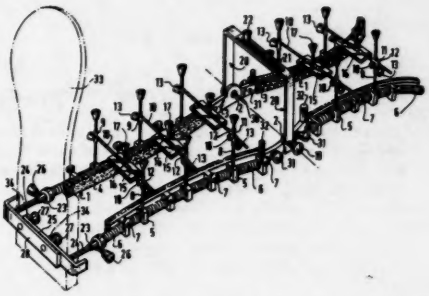
said sheath and the adjacent said first and second multi-filar coil segments of said elongated cross-wound multi-filar coil structural element relatively arranged and constructed, in combination, for interengagement in response to rotational force applied to the proximal end in a manner to provide a torque response, along the joined length, approaching 1:1, thereby allowing control of said distal tip of said guidewire within the body by application of rotational force to said proximal end portion outside the body.

5,065,770

APPARATUS FOR PLOTTING THE CONFIGURATION OF A LOWER LIMB OF THE HUMAN BODY WITH A VIEW TO PRODUCING AN ORTHESIS FOR PARAPLEGIC

Michel Palfray, Seurre, France, assignor to Etablissements Proteor, France

Filed Oct. 20, 1989, Ser. No. 424,535
Claims priority, application France, Oct. 21, 1988, 88 13841
Int. Cl.[5] A61B *5/10*
U.S. Cl. 128—774 8 Claims



1. Apparatus for plotting the configuration of a lower limb of the human body, comprising first and second pairs of upper and lower longitudinal upright splints arranged laterally respectively on first and second opposite sides of the lower limb, with the upper and lower longitudinal upright splints of each pair of splints being mutually articulated by an orthesis articulation (2), with each splint comprising a deformable metal strip (1) adjoining a deformable flexible tube (6), engaged in an opening in each of a plurality of plates (5) fixed to said deformable metal strip and extending generally perpendicular to an outer face of the deformable metal strip relative to the lower limb of the patient, and each plate (5) being provided with locking means (7) for locking the flexible tube (6) in position relative to the plate (5), to make the deformable metal strip rigidly integral in any position with the deformable flexible tube, such that the splints (1) are deformable and can be applied tightly against the lower limb to match the profile of the lower limb, and a plurality of crosspieces forming braces (8, 10, 12) which transversely connect the splints (1) on opposite sides of the lower limb at various intervals, the crosspieces (8, 10, 12) connecting the splints having an adjustable transverse dimension to regulate the transverse spacing of the splints, wherein certain of the crosspieces comprise two first elements (8), each of which is respectively integral with one of the splints (1) on opposite sides of the lower limb and connected by the crosspiece, said first elements (8) projecting laterally in a manner substantially perpendicular to the respective splint on each side of the limb, and two second elements (9–10, 11–12) adjustable in position, respectively, relative to the first elements, with the second elements being mutually coupled transversely in an adjustable manner, relative to the splints (1), such that at least one of the second elements can be brought into contact with the limb and an assembly including the second elements can be adapted to the transverse spacing of the splints, including locking means (13, 18) for locking the second elements relative to one another in an assembled position and relative to the first elements.

5,065,771

PROPHYLACTIC/CONTRACEPTIVE DEVICE

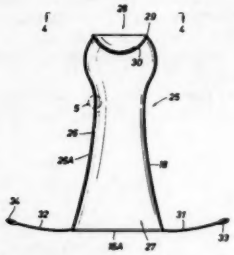
Jo A. Ferguson, 9014 Ilona, Houston, Tex. 77025

Filed Jul. 6, 1987, Ser. No. 70,053

The portion of the term of this patent subsequent to Jan. 19, 2007, has been disclaimed.

Int. Cl.[5] A61F *5/46*

U.S. Cl. 128—835 **4 Claims**



1. An improved prophylactic/contraceptive device, comprising

an open-ended pouch-like member removably insertable into and along a vaginal passage in a female body and having a flexible cap-like portion for releasably engaging and closing the entry portion of the cervix therein,

said pouch-like member further being formed of a thin flexible material impermeable to human body liquids and forming means to extend within a vaginal passage partially engaged over the labial surfaces adjacent the vaginal orifice, and

fastening means releasably attached to the exterior of said female body and flexibly interconnected with said pouch-like member adjacent said entrance to said vaginal passage for releasably securing said pouch-like member in said vaginal passage and partially covering the labial surfaces thereof,

said fastening means further including a pair of flexible tie members each having one end connected with said pouch-like member for extending said open-ended portion of said pouch-like member outwardly of said vaginal passage and away from the urinary tract in said female body.

5,065,772

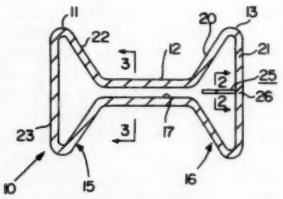
INFLATABLE CERIVICAL PESSARY

James E. Cox, Jr., Oxnard, Calif., assignor to Inamed Corporation, Carpinteria, Calif.

Filed Oct. 13, 1989, Ser. No. 421,202

Int. Cl.[5] A61F *6/16, 6/18*

U.S. Cl. 128—836 **5 Claims**



1. A cervical pessary having a central stem with a central passage from end to end thereof; a distal retainer at one end, and a proximal retainer at the other end, said retainers formed by walls which are hollow, flexible and distensible, and connected to one another through the central stem passage, said retainers being inflatable by fluid injected into them to extend laterally beyond said stem and abut against the uterus wall and the cervix to close the cervical passage with the stem being disposed in said cervical passage, and a fill valve in said proximal retainer, passing through an aperture in the wall of the proximal retainer, said valve comprising a pair of attached leaflets forming a passage between them, wherein said passage closes when outside pressure is exerted on said leaflets and said leaflets can physically be opened by insertion of a fill tube therein.

5,065,773

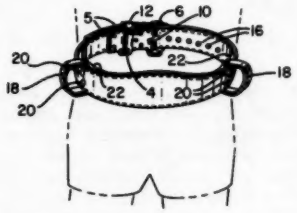
WEIGHTLIFTER'S BELT

Efram W. Jackson, 5017 Thompson Dr., Colony, Tex. 75056, and Aaron Jackson, Jr., 501 W. Horton, #24, Brenham, Tex. 75206

Filed Aug. 13, 1990, Ser. No. 566,106

Int. Cl.[5] A61F *5/37, 3/02;* **A63B** *21/072, 21/00*

U.S. Cl. 128—876 **3 Claims**



1. A weight lifting belt to be used by a weight lifter comprising: a wide, heavy leather belt having ends which overlap each other; means to adjustably secure the ends of said belt together around the weight lifter; a pair of spaced hand grips spaced along the belt between 90 to 180 degrees apart and aligned over the outer rear buttock of the weight lifter, each of said spaced hand grips comprising a strip of elongated semi-rigid material having ends which are joined to said belt on the interior side of the belt; and means to rigidly secure the ends of the grips to the belt.

5,065,774

PROCESS FOR EXPANDING TOBACCO UNDER MODERATE CONDITIONS

Robert E. Grubbs, Winston-Salem; Richard G. Haberkern, King; Michael E. Edwards, Windsor, all of N.C., and James D. Frederickson, late of Winston-Salem, N.C. by Agnes C. Frederickson, executrix , assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 18, 1989, Ser. No. 395,877

Int. Cl.[5] A24B *3/18*

U.S. Cl. 131—291 **20 Claims**

1. The process for increasing the filling capacity of tobacco comprising the steps:

(a) impregnating tobacco with a volatile impregnant having a boiling point less than 100° C.;

(b) subjecting the tobacco to pre-expansion temperature and pressure conditions including a pre-expansion temperature which is above the atmospheric boiling point of the impregnant and a pre-expansion pressure which is at least about 5 atmospheres above the boiling point pressure of the impregnant at said pre-expansion temperature, said pre-expansion temperature being at least about 10° C. below the critical temperature of the impregnant, whereby the impregnant is maintained primarily in the liquid phase throughout the pre-expansion treatment; and

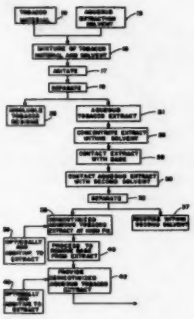
(c) rapidly reducing the pressure of the treated tobacco to a pressure below the boiling point pressure of the impregnant at said pre-expansion temperature to thereby effect expansion of the tobacco without the need for a subsequent heating step.

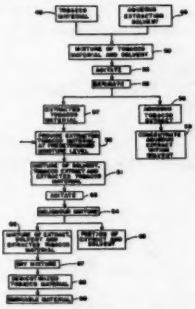
5,065,775

TOBACCO PROCESSING

Barry S. Fagg, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Feb. 23, 1990, Ser. No. 484,587
Int. Cl.[5] A24B *15/24, 15/26*
U.S. Cl. 131—297 41 Claims





1. A process for altering the character of tobacco material, the process comprising the steps of:

(a) providing extracted tobacco material by extracting tobacco material using a liquid extraction solvent and separating tobacco material not extracted by the solvent from the solvent and tobacco extract extracted by the solvent;

(b) providing a tobacco extract by extracting tobacco material using a liquid extraction solvent, thereby providing a tobacco extract within the extraction solvent;

(c) contacting the tobacco extract provided in step (b) within liquid extraction solvent with the extracted tobacco material provided in step (a) thereby providing a mixture of solvent, tobacco extract and extracted tobacco material; the mixture (i) including a weight of tobacco extractables greater than that weight of tobacco extract separated from the tobacco material in step (a), and (ii) including about 5 to about 40 percent extractables, based on the total weight of the solvent and tobacco extractables within the mixture;

(d) separating the extracted tobacco material from a portion of the solvent and tobacco extract, thereby providing a mixture of solvent, tobacco extract and extracted tobacco material; the mixture thereby having a solvent content ranging from about 60 to about 90 weight percent, based on the total weight thereof; and

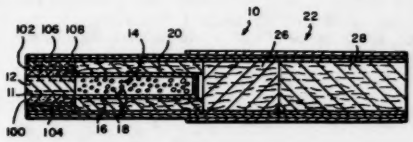
(e) separating at least a portion of the solvent from the mixture provided in step (d).

5,065,776

CIGARETTE WITH TOBACCO/GLASS FUEL WRAPPER

Jerry W. Lawson, and William J. Casey, III, both of Clemmons, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 29, 1990, Ser. No. 576,751
Int. Cl.[5] A24D *1/02, 1/18*
U.S. Cl. 131—365 20 Claims



1. A smoking article comprising:

(a) a combustible fuel element; and

(b) an insulating wrapper surrounding at lest a portion of the outer periphery of the fuel element, the insulating wrapper comprising at least two separate and distinct layers comprising:

(a) at least one layer of fibrous insulating material and

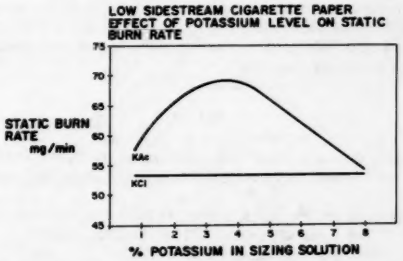
(b) at least one layer of a tobacco-containing material.

5,065,777

THERMALLY STABLE ASH CONDITIONERS FOR CIGARETTE PAPER, METHODS OF MAKING SUCH CIGARETTE PAPER AND SMOKING ARTICLES MADE FROM SUCH WRAPPERS—CASE III

William F. Owens, Jr., Pisgah Forest, N.C., assignor to P. H. Glatfelter Company, Spring Grove, Pa.

Filed Apr. 26, 1990, Ser. No. 514,886
Int. Cl.[5] A24D *1/02*
U.S. Cl. 131—365 11 Claims



1. A wrapper for smoking articles, comprising a cellulosic sheet, filler concentrations in said sheet in the range of 14 to 60 g/m^2, and a thermally stable, at the range of temperatures encountered in a burning smoking article, alkali metal ash conditioner in the sheet at a level of from about 2% to about 24% of the total weight of the sheet.

5,065,778

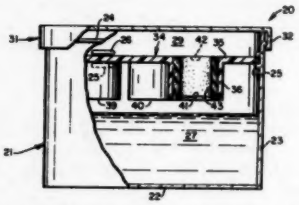
FINGER NAIL POLISH REMOVING DEVICE

Joye L. Terrell, 6516 Ridgeview Cir., Dallas, Tex. 75240

Filed Jun. 28, 1990, Ser. No. 544,985
Int. Cl.[5] A45D *29/18*
U.S. Cl. 132—74.5 12 Claims

1. A finger nail polish removing structural device compris-

ing: a cylindrical container for nail polish removing liquid having a base portion with a bottom wall and a screw on lid with a top wall joinable together when screwed together with a liquid tight sealing joint; a finger nail scrubbing structure mounted by circumference mounting means of said cylindrical container to extend transversely across the interior of said container in spaced relation to said bottom wall defining a chamber for containing nail polish remover liquid in said base portion; said finger nail scrubbing structure being a transverse bridging member generally coextensive with the interior of said cylindrical container, provided with five finger nail and finger tip receiving bore openings generally parallel to each other and generally perpendicular to said bottom wall; four of said bore openings of a substantially equal diameter being positioned on a circle within the planar extent of said transverse bridging member and with the fifth bore opening being a thumb end receiving opening with a larger diameter than said four substantially equal diameter bore openings and displaced closer to the center of said transverse bridging member than



the circle through the four bore openings to receive simultaneously the finger nails and nail finger tips to the nail joints of all five fingers of one hand; each of said finger bores having walls of sponge-like scrubbing material; said finger bore openings being dimensioned, bore size diameter and length, to receive the finger nails and finger tips to the nail joints of one hand in scrubbing relation for simultaneous scrubbing of the five finger nails of a hand; wherein said scrubbing structure forms a partition in space between said bottom wall and the top wall of said lid, with a top chamber between said scrubbing structure as a partition and said top wall; and said finger bore openings form fluid communication channels between said liquid chamber and said top chamber; said scrubbing structure includes a rigid member with cylindrical walled openings for said finger bore openings; and a cylindrical sponge-like material liner mounted in each of said cylindrical walled openings; and wherein said cylindrical sponge-like material liners are each a removable pad of a substantially rectangular piece of sheet sponge-like material.

5,065,779

WINDPROOF UMBRELLA

Gary D. Johnson, New York, and Stanley Hochfeld, Howard Beach, both of N.Y., assignors to Leonard Holtz, Oceanside, N.Y.

Division of Ser. No. 309,620, Feb. 10, 1989, Pat. No. 4,979,534. This application Oct. 30, 1990, Ser. No. 605,833

Int. Cl.[5] A45D *25/20*

U.S. Cl. 135—33.7 **26 Claims**

1. A windproof umbrella comprising:

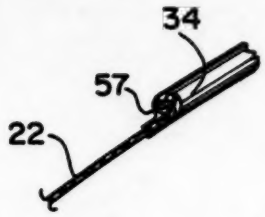
a post having a lower end to be grasped by a user and an opposite upper end;

a plurality of ribs extending outwardly in a radial direction from said upper end of said post;

a lower canopy secured in covering relation on said ribs, said lower canopy including a plurality of vent holes formed therethrough;

a plurality of channel forming means secured to said lower canopy in completely surrounding relation to each individual one of said vent holes for further preventing entry of water through each of said vent holes; and

an upper canopy positioned over said lower canopy in covering relation to said at least one vent hole, said upper canopy contacting said lower canopy over a major surface portion of said upper canopy in normal use of said umbrella and separating at least partly from said lower canopy, at least around peripheral edge portions of said upper canopy, responsive to application of wind from the underside of said umbrella.



5,065,780

METHOD AND MEANS FOR CONNECTING A BRANCH CONDUIT TO AN EXISTING CONDUIT

Thorkild O. Baumbach, Ankarvägen 4, S-761 40 Norrtälje, Sweden

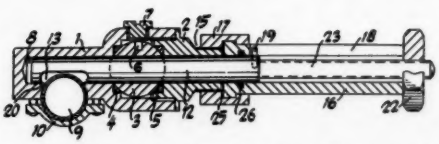
PCT No. PCT/SE88/00632, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO89/04938, PCT Pub. Date Jun. 1, 1989

PCT Filed Nov. 21, 1988, Ser. No. 476,368

Claims priority, application Sweden, Nov. 20, 1987, 8704595

Int. Cl.[5] F16K *43/00, 51/00*

U.S. Cl. 137—15 **8 Claims**



1. A method for connecting a branch conduit to an existing conduit through a valve having a flow channel extending transversely of the existing conduit, said method comprising

securing a tool to the valve at a location where the branch conduit is to be attached to the valve,

extending a piston from the tool through the flow channel of the valve to a position in which a portion of the existing conduit is received in a recess formed in a side of the piston prior to severing the conduit portion,

providing said recess with a sharp internal cutting edge,

displacing the piston from said position transversely across said conduit portion received in said recess to cause said cutting edge of the recess in the piston to sever said conduit portion whereby to provide communication between the interior of the existing conduit and said flow channel,

transporting the severed portion within said recess as the piston is displaced to a location outside said valve so that the severed portion can be removed, and

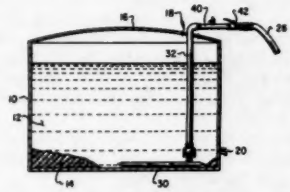
closing said valve and removing the tool and piston therefrom whereupon a branch conduit can now be connected to the valve and placed into communication with the existing conduit via said valve and said flow channel.

5,065,781

STORAGE TANK CLEANOUT APPARATUS

Ernest J. Cox, P.O. Box 714, Chico, Tex. 76030

Filed Mar. 22, 1990, Ser. No. 497,855
Int. Cl.[5] B08B 9/08
U.S. Cl. 137—15 16 Claims



11. A method for removing material from the bottom of a storage tank, comprising the steps of:

lowering a bottom hose having a plurality of openings into the tank;

connecting the bottom hose into an approximately circular shape while it is inside the tank;

attaching a riser hose to the bottom hose and lowering the bottom hose to the bottom of the tank;

pumping material out of the tank through the bottom hose and the riser hose;

when said material pumping step is completed, raising the riser hose out of the tank and disconnecting the riser hose from the bottom hose;

disconnecting the bottom hose from its approximately circular shape; and

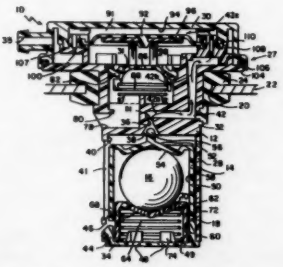
raising the bottom hose out of the tank.

5,065,782

TANK VENTING CONTROL ASSEMBLY

Emil Szlaga, Connersville, Ind., assignor to Stant Inc., Connersville, Ind.

Filed Jan. 8, 1991, Ser. No. 638,784
Int. Cl.[5] F16K 17/36
U.S. Cl. 137—39 20 Claims



1. An apparatus for controlling flow of fuel vapor and liquid fuel through an aperture in a fuel tank, the apparatus comprising

a housing mounted in the aperture and formed to include an outlet,

a float valve positioned in the fuel tank and formed to include a float chamber therein, the float valve being movable in the housing between a closed position blocking flow of fuel vapor and liquid fuel through the outlet and an open position allowing flow of fuel vapor through the outlet,

a ball positioned in the float chamber, and

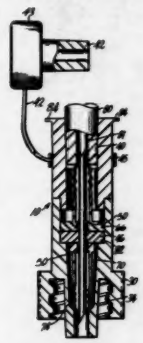
means for supporting the ball in the float chamber so that the ball is able to move in the float chamber in response to movement of the fuel tank to urge the float valve to its closed position, the supporting means being movable relative to the housing.

5,065,783

VALVE WITH SELF-SEALING INTERNAL CANNULA

George B. Ogle, II, 5616 Bonita, Alta Loma, Calif. 91701, assignor to George Braddock Ogle, II, Alta Loma, Calif.

Filed Sep. 20, 1990, Ser. No. 585,397
Int. Cl.[5] A61M 5/32
U.S. Cl. 137—68.1 23 Claims



1. A self-sealing valve insert comprising:

an elongated cannula having first and second shap ends; and

first and second elongated, flexible, resilient, elastomeric covers each disposed respectively over the first and second sharp ends of the cannula, each cover being secured to an intermediate portion of the cannula to provide a closed envelope over a respective adjacent sharp end of the cannula, and made of a material which is penetrable by the sharp ends of the cannula;

each cover, from where it is over a respective adjacent shape end of the cannula to a point adjacent where each cover is secured to the cannula, making a loose fit around the cannula so when a force is applied to the covers to move them relative to the cannula and toward each other, the covers are compressed, and each is penetrated by the respective adjacent sharp end of the cannula, and so when force is removed, each cover is free to expand back to its original rest position to form a seal over a respective adjacent sharp end of the cannula.

5,065,784

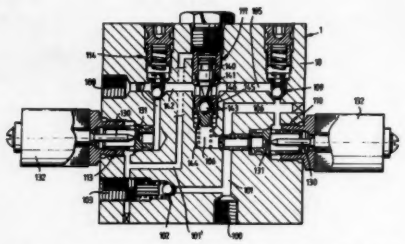
VALVE ASSEMBLIES AND MEANS

Anthony R. Davies, Cirencester; Steven J. Downward, Cheltenham, and David Chilvers, Minster Lovell, all of England, assignors to Smiths Industries public limited company, London, England

Filed Oct. 22, 1990, Ser. No. 600,697
Claims priority, application United Kingdom, Oct. 28, 1989, 8924318
Int. Cl.[5] F16K 17/18
U.S. Cl. 137—116 8 Claims

1. An hydraulic valve assembly for controlling supply of hydraulic fluid between a source of hydraulic pressure, an hydraulic device, and a reservoir, the assembly comprising: a first port connected to said source; a second port connected to said device; a third port connected to the reservoir; a first hydraulic line extending between said first port and said second port, the first hydraulic line including a check valve, the check valve enabling flow from the first port to the second port but preventing flow from the second port to the first port; a second hydraulic line connected between the third port and the first hydraulic line at a location intermediate the second

port and the check valve, the second hydraulic line including a normally-closed depressurizing valve which is openable to enable flow from the second port to the third port; and a third hydraulic line connected in parallel with the second hydraulic line between the third port and the first hydraulic line at a location intermediate the first port and the check valve, the third hydraulic line including a normally-open solenoid operated pressurizing valve connected in series with a normally



open pressure sensing valve such that fluid from the first port normally flows to the third port, the pressure sensing valve in the third line being closed in response to a fall in pressure at the second port below a first predetermined level and the pressurizing valve also being closable such that closure of either the pressurizing valve or the pressure sensing valve prevents flow along the third hydraulic line and diverts flow to the second port until pressure at the second port rises above a second predetermined level.

5,065,785

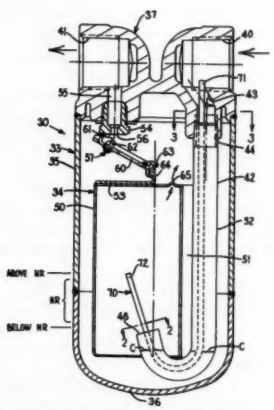
STEAM TRAP WITH SEPARATE STEAM AND CONDENSATE INLETS

Walter T. Deacon, Schoolcraft, Mich., and Albert V. Vyve, Chaudfontaine, Belgium, assignors to Armstrong International, Inc., Three Rivers, Mich.

Filed Aug. 24, 1990, Ser. No. 573,243

Int. Cl.[5] F16T *1/30*

U.S. Cl. 137—185 **10 Claims**



5. An inverted bucket steam trap comprising:

a casing;

condensate and steam inlet means to said casing and condensate outlet means from said casing;

a bottom opening inverted bucket free to float up and down in said casing;

valve means operatively interposed between said condensate outlet means and the interior of said casing and responsive to elevation of said inverted bucket to a predetermined level in said casing for closing said valve means and further responsive to a drop of said inverted bucket in said casing for opening said valve means;

means for directing the condensate and steam from said condensate and steam inlet means upward into the bottom of said inverted bucket, said directing means including condensate surface stabilizing means in said bucket for (1) directing steam upward into the bottom of the inverted bucket past condensate in said bucket while (2) preventing turbulence and splashing of the condensate surface in said bucket by shielding the condensate surface in the bucket from upward steam flow therethrough, said stabilizing means comprising two separate outlets opening in said bucket, namely

(1) a condensate outlet at a first level in said bucket and

(2) a steam outlet at a second level in said bucket and spaced above said first level.

5,065,786

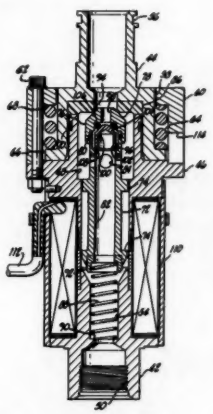
FLOW CONTROL VALVE

Mike M. Rozenblatt, Manhattan Beach, Calif., assignor to Monogram Sanitation, a division of MAG Aerospace Industries, Inc., Compton, Calif.

Filed Apr. 10, 1990, Ser. No. 507,383

Int. Cl.[5] F16K *24/02*

U.S. Cl. 137—202 **7 Claims**



1. A flow control valve, comprising:

(a) a valve housing having a bore therethrough and a valve seat surrounding the bore adjacent one end thereof;

(b) a valve member axially movable within the bore of the housing between a normally closed position against the seat to stop flow and an open position spaced from the seat to permit flow through the housing when the supply line is pressurized, the valve member further including a bore therethrough;

(c) a seal surrounding the bore of the valve member; and

(d) a lightweight float that is freely floating and axially movable a limited distance within the bore of the valve member between a closed position against the seal to stop flow when the supply line is pressurized and the valve member is in the closed position and an open position spaced from the seal to permit flow through the valve member and draining of the supply line when the supply line is depressurized and the valve member is in the closed position, wherein the float is in the form of a hollow body having an open lower end and a loosed upper end, whereby fluid from the supply line is adapted to flow into the open end of the hollow body such that the float is very sensitive to the introduction of pressure in the supply line

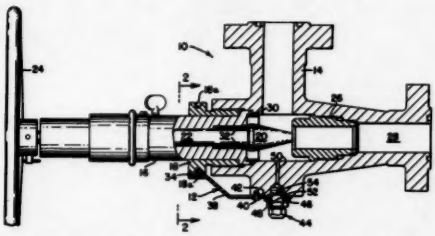
and the upper end of the float is adapted to quickly move against the seal at a pressure of less than one psi.

5,065,787

CHOKE VALVE SAFETY DEVICE

Bernhard Lochmann, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,662
Int. Cl.[5] F16K *35/02, 51/00*
U.S. Cl. 137—315 **6 Claims**



1. A safety device for use with a choke valve to prevent disassembly of the valve until fluid pressure therein has been vented, said safety device comprising

a) a cover bracket overlying a tool engaging portion of a choke valve bonnet nut for preventing access to said choke valve bonnet nut by a nut removal tool;

b) a plate bracket attached to said cover bracket for supporting the cover bracket on a choke valve body;

c) alignment means being disposed on said choke valve body for properly positioning the safety device on the choke valve body; and

d) vent means being disposed on said choke valve body for releasably securing the safety device to the choke body.

5,065,788

ACCURATE HIGH-FLOW CLEAN REGULATOR WITH INPUT-PRESSURE BALANCING

Paul G. McManigal, 16 Inverness La., Newport Beach, Calif. 92660, and Philip A. Vaughan, 1540 S. Bellwood Rd., San Marino, Calif. 91108

Filed Dec. 4, 1990, Ser. No. 621,754
Int. Cl.[5] G05D *16/06*
U.S. Cl. 137—505.18 **23 Claims**

1. In a high pressure gas regulator, the combination comprising

a) an axially movable poppet and an orifice controlled by the poppet in response to poppet axial movement, the orifice having upstream and downstream sides,

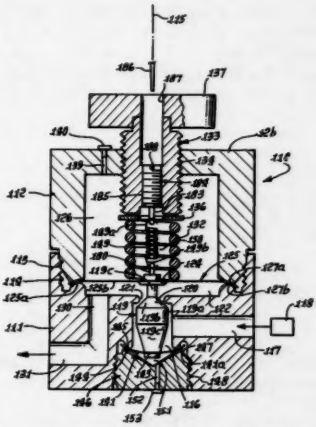
b) a metallic main diaphragm responsive to gas pressure at the downstream side of the orifice and having operative connection with the poppet to extend openly proximate the orifice and to control poppet movement toward or away from the orifice in response to an increase or decrease in pressure at the downstream side of the orifice, respectively, the poppet and orifice defining interengageable annular surfaces,

c) auxiliary pressure responsive means comprising an auxiliary pressure responsive unit defining a pressure sensitive, thin metallic member, at the upstream side of the orifice to control the relative motion of the poppet and orifice toward or away from each other in response to a decrease or increase in pressure at the upstream side of the orifice, respectively,

d) housing means enclosing said poppet, orifice, main diaphragm, and auxiliary pressure responsive means, said housing means having a gas pressure inlet and a gas pressure outlet, said inlet communicating with the upstream side of the orifice, and said outlet communicating with the downstream side of the orifice,

e) a poppet spring operatively connected with the poppet to yieldably urge the poppet toward the orifice, said spring located outside the gas flow,

f) and a range spring operatively connected with the main



diaphragm to yieldably urge the main diaphragm toward the orifice, and including an adjustment means operatively connected with the range spring to adjust the tension thereof,

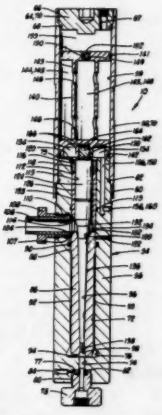
g) said housing means having metallic sealing relation with the main diaphragm and with said auxiliary pressure responsive metallic member.

5,065,789

BACK PRESSURE REGULATING VALVE FOR ULTRA HIGH PRESSURES

David M. Eslinger, Broken Arrow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 13, 1990, Ser. No. 581,819
Int. Cl.[5] F16K *17/02*
U.S. Cl. 137—513.5 **19 Claims**



1. A back pressure regulating valve comprising:

a body defining a body central opening with an inlet and an outlet therein;

a seat in said body central opening and defining an elongated tapered seat surface therein;

a poppet having an elongated tapered poppet surface thereon disposed in said seat and adjacent to said seat surface such that an elongated, annular tapered flow path is defined between said inlet and outlet when said poppet is in an actuated position, said flow path having a length greater than a maximum diameter of said poppet, and wherein a minimum annular tapered flow path is defined between said seat and poppet when said poppet is in an unactuated position;

biasing means for biasing said poppet toward said seat; and

means limiting movement of said poppet toward said seat by said biasing means.

5,065,790

CHECK VALVE

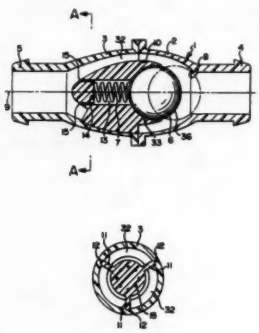
Christof Kornas, Wiesbaden, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 20, 1990, Ser. No. 585,442

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931437

Int. Cl.[5] F16K *21/10*

U.S. Cl. 137—514.5 **25 Claims**



1. A check valve comprising:

a housing having:

(a) an inside wall including a plurality of grooves,

(b) a first opening adapted for connection to a vacuum source, and

(c) a second opening adapted for connection to a vacuum user,

said first and said second openings having a common axis;

a guide member within said housing and fixed to said housing between said first and said second openings, said guide member having a corresponding plurality of radial fins fitted within said grooves in said inside wall of said housing and having a recess at an end thereof facing said second opening;

a sealing seat formed in said housing at said second opening;

a valve body movable toward and away from said sealing seat and guided for at least part of its movement within said recess;

and a spring within said housing urging said valve body toward said sealing seat.

5,065,791

FLUID PURIFYING APPARATUS AND METHOD OF PURIFYING FLUIDS

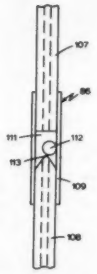
Steven L. Miller, Shelby; Ronald L. Wathen, and Raymond E. Palazzo, Jr., both of Jefferson, all of Ky., assignors to Environmental Water Technology, Inc., Louisville, Ky.

Division of Ser. No. 515,459, Apr. 27, 1990, Pat. No. 5,017,284.

This application Oct. 11, 1990, Ser. No. 596,089

Int. Cl.[5] F16K *15/04*

U.S. Cl. 137—515 **1 Claim**



1. An immediate pressure responsive single check valve for a vertically extending fluid flow conduit line comprising: a break in said vertically extending conduit line with opposed ends of said break bcing spaced from each other; a flow-through sleeve connected to said opposed spaced ends of said break, said sleeve having a substantially uniform cross-section throughout to define an enclosed uninterrupted chamber between said opposed ends; a float valve disposed in said enclosed chamber of preselected size and preselected specific gravity below the specific gravity of the fluid flow in said conduit line to close only one broken line end of said conduit line to further liquid flow until pressure in said closed broken line end reaches a predetermined upper level for immediate response thereto; said spaced opposed end of said broken conduit line being contoured and sized to remain continuously and substantially fully open to said enclosed chamber when said float valve is urged there against by said pressure, said float valve being ball-shaped and of greater diameter than the inner diameter of the opposed line end, said opposed line end being contoured to be of downwardly extending triangular apex shape to include a groove at said apex sized to nestingly receive only a minor portion of said ball-shaped float valve urged thereagainst by said line pressure without closing said opposed line end so that said opposed line end is in substantially full communication with said opposed chamber.

5,065,792

COUPLING MECHANISMS FOR ROTARY FLUID CYLINDERS

Koziro Ohta, Fukuyama; Yoshihito Kurogi, Hiroshima, and Yasuo Suzuki, Fukuyama, all of Japan, assignors to Kitagawa Iron Works Co., Ltd., Hiroshima, Japan

Filed Oct. 9, 1990, Ser. No. 595,264

Int. Cl.[5] B23B *31/30*

U.S. Cl. 137—580 **12 Claims**

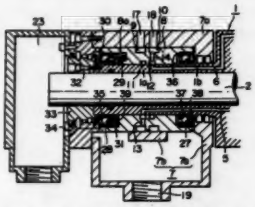
1. A coupling mechanism for a rotary fluid cylinder which comprises a rotary member; a fluid feeding member concentrically mounted on said rotary member; and at least one fluid passage means for supplying fluid from said fluid feeding member to said rotary member even while said rotary member is rotating,

said coupling mechanism comprising:

a pair of ball bearings interposed between said fluid feeding member and said rotary member at respective extreme end portions of said fluid feeding member so as to allow relative rotation of said rotary member with respect to said

fluid feeding member, said ball bearings each having an outer ring; and

means for applying a predetermined pre-load to said respective ball bearings in such a manner that said ball bearings are biased so as to move away from each other, said pre-load being applied to said outer ring of said respective ball bearings.



5,065,793

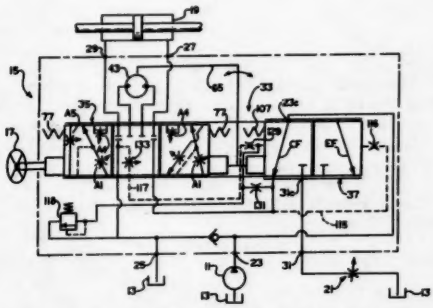
FLUID CONTROLLER WITH LOAD SENSING PRIORITY FLOW CONTROL CAPABILITY

Dwight B. Stephenson, Savage, and Dennis R. Marks, Eden Prairie, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 513,366, Apr. 23, 1990, Pat. No. 5,016,672. This application Mar. 7, 1991, Ser. No. 666,168

Int. Cl.[5] F15B *13/06*

U.S. Cl. 137—625.24 **34 Claims**



1. A controller operable to control the flow of fluid from a source of pressurized fluid to a priority fluid pressure operated device, and to an auxiliary fluid location; said controller being of the type including housing means defining an inlet port for connection to the source of pressurized fluid, and first and second control fluid ports for connection to the priority fluid pressure operated device; valve means disposed in said housing means, and comprising a primary, rotatable valve member and a cooperating, relatively rotatable follow-up valve member, said primary and follow-up valve members defining a neutral rotary position, a rotary operating position in which said primary valve member is rotatably displaced from said neutral rotary position, relative to said follow-up valve member, and said follow-up valve member defining a first axial position; said primary valve member defining first and second fluid passages, and said follow-up valve member defining a first fluid port in continuous fluid communication with said inlet port when said valve members are in said first axial position, and a second fluid port in continuous fluid communication with said first control fluid port; said first fluid port being blocked from fluid communication with said first fluid passage, and said second fluid port being blocked from fluid communication with said second fluid passage when said valve members are in said neutral rotary position; said first fluid port being in fluid communication with said first fluid passage, to define a first variable flow control orifice, and said second fluid port being in fluid communication with said second fluid passage, to define a second variable flow control orifice when said valve members are in said rotary operating position; said housing means and said valve members cooperating to define a main fluid path providing fluid communication between said first and second variable flow control orifices when said valve members are in said rotary operating position; characterized by:

(a) said follow-up valve member defining a second axial position;

(b) said controller including means operable to bias said follow-up valve member toward said first axial position, and means operable to bias said valve members toward said second axial position;

(c) said housing means and said follow-up valve member cooperating to define a pressure fluid chamber in continuous fluid communication with said inlet port, and an auxiliary fluid chamber in continuous fluid communication with an excess flow port;

(d) said first fluid port being blocked from fluid communication with said pressure fluid chamber when said follow-up valve member is in said second axial position; and

(e) said housing means and said follow-up valve member cooperating to define an axial fluid passage disposed to provide communication from said pressure fluid chamber to said auxiliary fluid chamber when said follow-up valve member is in said second axial position.

5,065,794

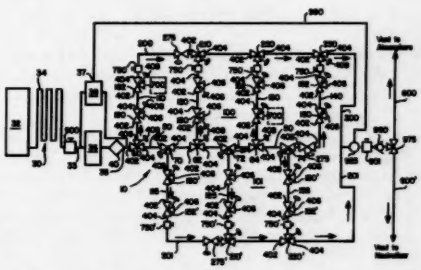
GAS FLOW DISTRIBUTION SYSTEM

Steven D. Cheung, Danbury, Conn., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Nov. 26, 1990, Ser. No. 617,768

Int. Cl.[5] F16K *11/10*

U.S. Cl. 137—883 **8 Claims**



7. A continuous flow distribution system for distributing gas or fluid to a plurality of outlets comprising

(i) supply means for continuously introducing pressurized fluid or gas into said system;

(ii) venting means downstream from said supply means for continuously receiving pressurized gas or fluid and for releasing pressurized fluid or gas from said system;

(iii) main line conduit means in communication between said supply means and said venting means;

(iv) loop conduit means in communication between said supply means and said venting means;

(v) lateral conduit means in communication from said main conduit means to said loop conduit means;

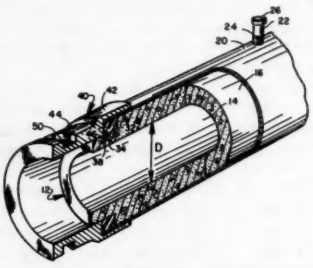
(vi) a plurality of outlet valve means in said lateral conduit means each said outlet valve means having first and second ports which are in serial communication with each other and a third port with adjustable means for adjustably opening and closing said third port.

5,065,795

PRESTRESSED CONCRETE ARTICLES

Richard L. Creedon, San Diego, Calif., assignor to General Atomics, San Diego, Calif.

Division of Ser. No. 317,821, Mar. 1, 1989, Pat. No. 4,936,006.
This application Mar. 5, 1990, Ser. No. 488,884
Int. Cl.[5] F16L 9/08
U.S. Cl. 138—176 6 Claims



1. A prestressed concrete article comprising:

a cylindrical body with opposed ends and a generally cylindrical outer surface;

a cylindrical jacket having a predetermined strength to resist distortion when placed under pressure, said jacket placed around the outer cylindrical surface of the concrete article;

end walls of greater strength overlying the ends of the article, adjacent the ends of the jacket;

gasket rings between the end walls and the ends of the concrete article;

end joining means for joining the ends of the jacket to the end walls so that tension forces applied to the end walls compress the end walls against the ends of said concrete article;

a hardenable medium fluidally injected between said jacket and said outer surface of said concrete article, migrated throughout the major portion of said concrete article outer surface;

an annular cavity between said jacket and said concrete article outer surface formed by an outward swelling of said jacket by said injected medium, said cavity filled with said hardenable medium; and

ends of the jacket compressed together, pressing said gasket rings against the ends of said concrete article, with said gasket rings entering into said cavity under the pressure of said hardenable medium, said gasket rings intimately engaging and generating a sealing pressure between opposed portions of said jacket and said concrete article outer surface;

whereby a fluid-tight pressure cavity is formed surrounding the outer surface of said concrete article and maintaining the pressure until the injected medium hardens.

5,065,796

LOOM TEMPLE CONTROL SYSTEM TO VARY PICK DENSITY

Ernest F. Roach, Eden; Stephen D. Frick, and Randell F. Sample, both of Greensboro, all of N.C., assignors to Draper Corporation, Greensboro, N.C.

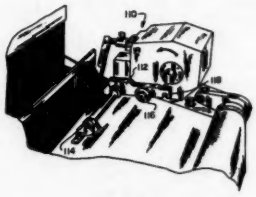
Filed Oct. 2, 1990, Ser. No. 591,774
Int. Cl.[5] D03J 1/22
U.S. Cl. 139—300 18 Claims

1. An apparatus for a power loom for automatically varying the pick density of a woven fabric produced by said loom between a first density value to a second, substantially different density value, said apparatus comprising:

(a) first means associated with said loom for supplying a fill yarn having a first predetermined denier value suitable for forming the portion of said woven fabric corresponding to said first density value;

(b) means associated with said loom for adjusting the pick density of said woven fabric;

(c) temple means for holding said woven fabric at a predetermined width, said temple means being selectively operable between a first position out of engagement with said woven fabric and a second position in engagement with said woven fabric; and



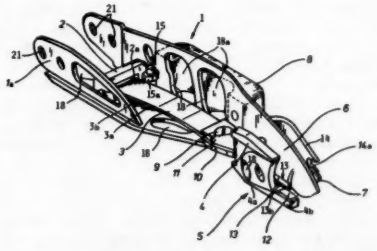
(d) control means connected to said first means for supplying a fill yarn, said means associated with said loom, and said temple means, said control means being operable to selectively engage said temple means and to permit sad loom to vary the pick density of said woven fabric while maintaining said woven fabric at a predetermined width without operator intervention.

5,065,797

GRIPPER HEAD FOR SHUTTLELESS LOOMS

Horst Haeussler, Lindau; Hubert Ortmann, Hergatz, and Harald Stoerr, Lindau, all of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft m.b.H., Lindau, Fed. Rep. of Germany

Filed Jul. 13, 1990, Ser. No. 552,820
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923540
Int. Cl.[5] D03D 47/20
U.S. Cl. 139—448 20 Claims



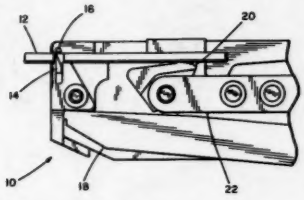
1. A gripper head for a shuttleless loom, comprising a gripper body, clamping means carried by said gripper body for gripping a weft thread, said clamping means comprising a stationary clamping pad and a movable clamping pad arranged for cooperation with said stationary clamping pad for gripping said weft thread, spring means for tiltably holding said movable clamping pad at a free end of said spring means near a forward end of said gripper body, means for mounting said spring means to said gripper body at another end of said spring means, and wherein at least one of said stationary and movable clamping pads comprises a two layer structure including a vibration damping layer and a wear resistant outer layer.

5,065,798

STRETCHED STRAP CABLE TIE TENSIONING AND SEVERING TOOL

John S. Alletto, Frankfort, and Maurice M. Maurer, Elmhurst, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Jan. 28, 1991, Ser. No. 646,968
Int. Cl.[5] B21F 9/02
U.S. Cl. 140—123.6 6 Claims



1. A cable tie application tool, comprising:

means for positioning a cable tie strap between a severance blade and an anvil; and

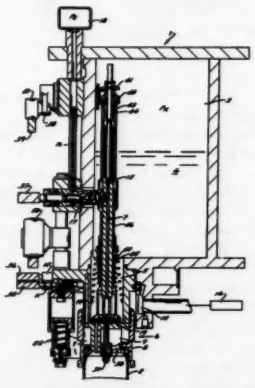
means for moving the severance blade completely through the strap and into engagement with the anvil to sever the strap, wherein the anvil is formed of a ductile metallic material and wherein the blade is of a greater hardness than the anvil sufficient to allow the blade to penetrate the anvil to form a groove therein.

5,065,799

APPARATUS FOR FILLING CANS

Wilhelm Weiss, Lappersdorf, Fed. Rep. of Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubaling, Fed. Rep. of Germany

Division of Ser. No. 424,618, Oct. 20, 1989, Pat. No. 5,000,234.
This application Dec. 14, 1990, Ser. No. 627,703
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836489
Int. Cl.[5] B65B 31/00
U.S. Cl. 141—39 4 Claims



1. Apparatus for filling cans each having an open mouth with liquid comprising:

a tank for containing the liquid and a mixture of inert gas and air,

a filler unit mounted to the tank and means for coupling the open mouth of said can sealingly to the unit, said unit having a liquid control valve interposed between the tank and the can and having a gas return tube extending from the tank into the can and a gas control valve within the gas return tube for controlling interchange of gas between the tank and the can through the tube,

said filler unit including a differential pressure chamber arranged between the can and the tank and being adjacent the mouth of the can,

a flush valve having an inlet communicating with said differential pressure chamber and an outlet for discharging gas from the can to the atmosphere,

means for opening and closing said gas control valve and flush valve in a sequence wherein said gas control valve and flush valve are opened for said inert gas and air mixture to flow from said tank through said tube and through said can and chamber and flush valve for flushing the can and chamber of air so as to replace the air with the inert gas mixture after which said valves close,

a source of undiluted inert gas at a pressure slightly below the pressure in said tank,

an inert gas control valve having an inlet coupled to said source and an outlet coupled to a passageway in said filler unit which leads directly to said can so that sequential opening and closing of said inlet gas control valve causes said can to receive inert gas and to displace a substantial portion of the inert gas and air mixture in the can into said differential pressure chamber,

said can is filled with liquid by opening said gas control valve causing pre-pressurizing of said can through said tube at the pressure of the gas mixture in said tank, said liquid control valve responds to the pressures in the tank and can becoming equilibrated by opening to fill said can with liquid while at the same time the liquid displaces said inert gas from the can into the tank,

a relief valve having an inlet in communication with the gas above the liquid in the can and an outlet to the atmosphere,

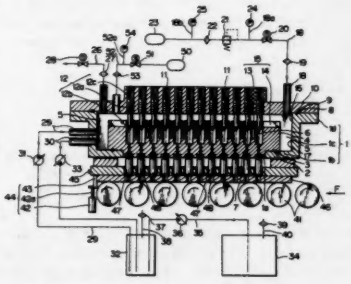
said gas control and liquid control valves closing when said can fills with liquid to a level which results in closing said tube and said relief valve opening to discharge the gas in said can and differential pressure chamber to the atmosphere before uncoupling the can from the filler unit.

5,065,800

LIQUID CHARGING METHOD AND A LIQUID CHARGING APPARATUS

Takayoshi Sagawa, and Shichisei Tani, both of Yokohama, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 554,780
Claims priority, application Japan, Jul. 24, 1989, 1-188732
Int. Cl.[5] B65B 3/30
U.S. Cl. 141—67 6 Claims



1. A liquid charging apparatus comprising:

a conveyor;

a tray disposed on the conveyor, the tray having an array of container-accommodating recesses arranged at specified pitches for accommodating containers with their upper ends opened;

a stop device for stopping said tray on the conveyor at a liquid-charging position;

a pit block having an array of pits and small-diameter nozzles, both formed therein and arranged above the corresponding container-accommodating recesses in the tray located at the liquid-charging position, said pits opening at an upper surface of the pit block, said small-diameter nozzles each extending downwardly from a bottom of each pit and opening at an underside of the pit block;

a frame enclosing an outer circumference of the pit block to form a liquid-accommodating portion between the frame and the pit block;

liquid guide grooves formed in an upper surface of the pit block for communicating each of the pits with the liquid-accommodating portion;

a cover mounted on an upper edge of the frame to form an enclosed space inside the frame;

an exhaust piping for communicating the enclosed space with the open air through a valve;

a pressurized air piping for communicating the enclosed space with a pressurized air source through a valve, whereby a pressure is applied to the liquid in the pits to force the liquid to be charged into the containers on the tray at the liquid-charging position;

a liquid supply piping for communicating the liquid-accommodating portion with a liquid tank through a supply pump; and

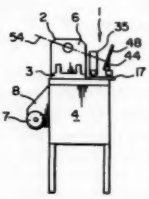
a liquid discharge piping for communicating the liquid-accommodating portion with the liquid tank.

5,065,801

LATHE ATTACHMENT DUPLICATING DEVICE

Alex Vincent, 1112 Sacramento Drive, S.W., Calgary, Alberta, Canada T2W 0J2

Filed Oct. 1, 1990, Ser. No. 590,771
Int. Cl.[5] B23B *8/28*
U.S. Cl. 142—38 **8 Claims**



1. A duplicating device for use on a lathe comprising frame means for mounting behind the centerline defined by a live center and a tailstock center of a lathe; mirror means on said frame means extending parallel to the centerline of the lathe in the use position; and template carrier means on said frame means between said mirror means and the centerline in the use position.

5,065,802

DADO LATHE

Kenneth D. Peterson, 1001 W. Euclid, Indianola, Iowa 50125

Filed Sep. 18, 1990, Ser. No. 584,205
Int. Cl.[5] B27C *5/00, 7/00;* B23B *3/28*
U.S. Cl. 144—2 R **22 Claims**

1. In combination with a table saw having a rotating dado blade with a perimeter cutting edge, a device for turning an elongated wood stock having a longitudinal axis from a square cross section to a round cross section, the device comprising:

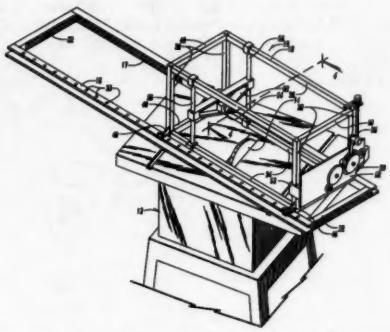
a pair of spaced apart rails mounted on the table saw at an oblique angle with respect to the blade;

a frame mounted on the rails for movement along the rails, and having opposite ends and opposite sides;

stock mounting means for rotatably mounting the stock on the frame such that the stock is disposed at an oblique angle to the edge of the blade;

means for rotating the stock about its longitudinal axis; and

means for moving the frame along the rails such that the



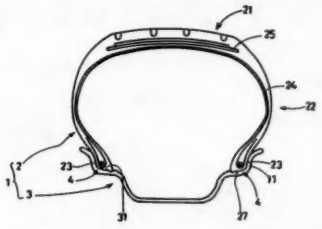
rotating blade produces a helical cut for each revolution of the stock, with adjacent cuts overlapping one another so as to produce a round stock from the square stock.

5,065,803

TIRE AND WHEEL RIM ASSEMBLY

Akihiro Nakatani, Kakogawa, and Hideaki Nagayasu, Toyota, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Nov. 6, 1990, Ser. No. 610,144
Claims priority, application Japan, Nov. 17, 1989, 1-300637
Int. Cl.[5] B60C *15/06*
U.S. Cl. 152—543 **1 Claim**



1. A tire and wheel rim assembly comprising a wheel rim and a tire mounted thereon,

the tire having a pair of axially spaced bead portions,

the wheel rim having a pair of axially spaced bead seats upon which the bead portions of the tire are seated,

at least one of the bead seats are provided at the axially inner edge thereof with a circumferential groove,

at least one of the bead portions provided with a toe extending radially inwardly into said circumferential groove, wherein

each bead portion comprises a soft rubber layer disposed along the bottom face of the bead portion to form said bead toe, an adjacent hard rubber layer disposed radially outside the soft rubber layer, and a fabric reinforcing layer disposed between said soft rubber layer and said adjacent hard rubber layer such that there is no contact between said soft rubber layer and adjacent hard rubber layer,

said soft rubber layer is covered by a fabric chafer disposed along the contour of the bead portion,

said hard rubber layer is made of relatively hard rubber having a JIS A hardness (HS1) of not less than 60 and not more than 95,

said soft rubber layer is made of soft rubber having a JIS A hardness (HS2) of not less than 48 and not more than 90, and

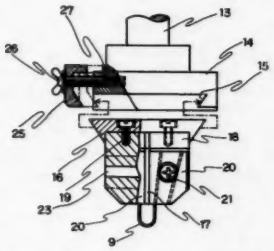
the ratio HS2/HS1 of the hardness (HS2) of the soft rubber layer to the hardness (HS1) of the hard rubber layer is not less than 0.7 and not more than 0.95.

5,065,804

CUTTER SUPPORTING UNIT FOR TIRE GROOVING APPARATUS

Satoru Kinuhata; Masao Takami, both of Kobe; Eiji Shibata, Nakama, and Tadahiko Tamura, Kitakyushu, all of Japan, assignors to Sumimoto Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 285,555, Dec. 16, 1988, abandoned. This application Apr. 1, 1991, Ser. No. 679,826
Claims priority, application Japan, Dec. 19, 1987, 62-322205
Int. Cl.[5] B29D *30/68;* B26D *7/26*
U.S. Cl. 157—13 **2 Claims**



1. A cutter supporting unit for a tire grooving apparatus having a tire supporting shaft and a cutter supporting unit which is movably and detachably supported so as to bring a cutter in and out of contact with a tire held by the tire supporting shaft, said cutter supporting unit comprising:

a cutter holder which holds a cutter; and

a cutter supporting frame to which the cutter holder is connected removably;

wherein said cutter supporting frame includes clamping means having an engaging groove formed in a dovetail shape, said clamping means has a tightening piece and a tightening screw, said tightening screw passes through said tightening piece and engages with said cutter supporting frame, and said cutter holder has a base formed in a substantially trapezoidal shape fitting said dovetail shape of said clamping means engaging groove.

5,065,805

DISPLAY ENCLOSURE AND SEGMENTED FLEXIBLE CLOSURE THEREFOR

David M. Barrett, Fort Myers, Fla., and Timothy J. Brown, Oklahoma City, Okla., assignors to David M. Barett, Ft. Myers, Fla.

Filed Apr. 4, 1991, Ser. No. 680,380
Int. Cl.[5] E06B *9/08*
U.S. Cl. 160—23.1 **9 Claims**

1. A display enclosure comprising:

a rigid housing having an upper part and a lower part, and having a vertically extending opening on one side thereof extending predominantly in a single vertical plane;

track means at opposite sides of the opening in the housing:

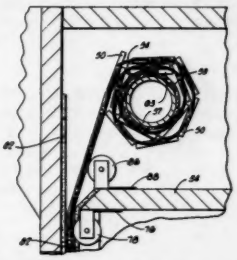
roller means mounted on the upper part of said housing above the opening, and supported for rotation about a substantially horizontally extending axis extending substantially parallel to said plane; and

a segmented curtain connected to said roller means for undergoing a rolling up or down movement upon rotation of said roller means about said axis in a selected direction of rotation, said segmented curtain comprising:

a plurality of contiguous, elongated generally rectangular slats each including a pair of opposed, parallel, longitudinal edges, and each including a pair of opposite ends extending slidingly into said track means;

bracket means each connected to one of the opposite ends of each of said slats so that each of said slats is connected through its opposite ends to a spaced pair of said bracket means; and

a pair of spaced, elongated, flexible connecting elements each having an end part connected to said roller means, and each having a plurality of spaced connection points



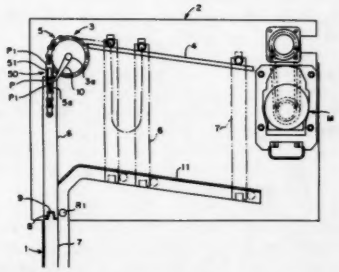
located along its length spaced from each other by a distance slightly greater than the width of said slats between said parallel, longitudinal edges and connected at each of said connection points to one of said bracket means, said connecting elements hanging said slats in a substantially monoplanar array across and closing said opening when said segmented curtain is rolled down by rotation of said roller means about said axis in a selected direction of rotation.

5,065,806

PANEL SHUTTER ASSEMBLY

Kohichi Kondoh, Tokyo, Japan, assignor to Bunka Shutter Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1991, Ser. No. 645,842
Claims priority, application Japan, Jun. 5, 1990, 1-146930
Int. Cl.[5] E06B *9/26*
U.S. Cl. 160—36 **5 Claims**



1. In an apparatus for driving a panel shutter including a plurality of shutter panels which are movable between a panel housing and an opening defined between a pair of upstanding guide rails depending from said housing, a pair of chains between which said panels are supported one after another, and a pair of sprockets supported rotatably in said housing and engaging said chains, respectively, to move said chains in either direction to move said panels, the improvement which comprises:

said chains each comprising a plurality of links including a plurality of spaced apart link attachments each having a longitudinally extending pin guide slot, each of said panels being suspended from a pair of long pins each having one end connected to said each panel, said each pin extending

through said slot of one of said link attachments slidably along said slot; and

a pair of arms each connected to a shaft on which one of said sprockets is rotatably supported, and having a free end portion projecting beyond the outer periphery of said one sprocket engageably with one of said pair of long pins, said each arm being rotatable with said one sprocket and having in said free end portion thereof a rotating speed which is higher than the peripheral velocity of said one sprocket, so that said long pins may be moved along said slots faster than said chains are moved about said sprockets, when said panels are each moved from said opening into said housing.

5,065,807

FOLDING DOOR STRUCTURE

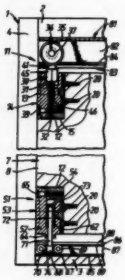
Kenji Maeda, Kitakyushu, and Nobuyuki Yamada, Kokubunji, both of Japan, assignors to Dantani Co., Ltd., Fukuoka and Murakoshi Screw Mfg. Co., Ltd., Tokyo, both of, Japan

Filed Jun. 6, 1989, Ser. No. 362,052

Claims priority, application Japan, Jun. 6, 1988, 63-75138

Int. Cl.[5] E05D *15/26*

U.S. Cl. 160—206 **4 Claims**



1. A folding door structure, comprising a folding door formed by a pair of door sections which are coupled together pivotally along adjacent edges thereof,

an upper guide rail disposed above the folding door and being formed with a downwardly facing rail groove defining roller-support surfaces,

a lower guide rail disposed below the folding door and being formed with an upwardly facing rail groove defining roller-receiving surfaces

and an upper guide body and a lower guide body for each door section, each upper guide body including an upper base member fixed in the upper portion at the outer end side of each respective door section, a support shaft extending upwardly from the upper base member and an upper roller support member mounted on the support shaft so as to be rotatable about a vertical axis and supporting rollers which are rotatable about a horizontal axis, the rollers being further supported by, and displaceable along, the roller support surfaces of the upper guide rail, and each lower guide body including a lower base member fixed in the lower portion at the outer end side of each respective door section and lower roller support member mounted on a further support shaft so as to be rotatable about a vertical axis and supporting further rollers which are rotatable about a horizontal axis, the further rollers being in engagement with, and displaceable along, the roller-receiving surfaces of the lower guide rail, the further support shaft being biassed resiliently upwards by a spring housed within the lower base member thereby to permit relative displacement of the lower base member and the rollers supported by the lower roller support member, and

wherein each said upper base member and each said lower base member comprises a cup fixed within a respective groove formed in the door section and a block so configured as to fit inside the cup, and the cup has an internal projection and the block has a complementarily shaped recess.

5,065,808

TAMBOUR DOOR FOR BOX-TYPE FURNITURE

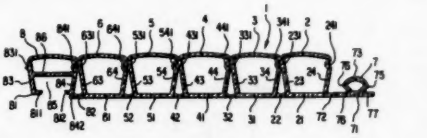
Siegfried Hopperdietzel, Selb, Fed. Rep. of Germany, assignor to Rehau AG & Co., Rehau, Fed. Rep. of Germany

Filed Nov. 7, 1990, Ser. No. 610,067

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 8913557

Int. Cl.[5] E06B *9/00*

U.S. Cl. 160—231.2 **8 Claims**



1. A tambour door for box-type furniture, comprising:

at least one tambour door element comprised of a plurality of profiled members which are elongate tube and which have hollow, trapezoidal cross-sections each including a base, a pair of arms, and a top, which arms extend from lateral edges of said base to lateral edges of said top, and which top comprises a side of the tambour door element to be viewed in use and is wider than the base; and a plurality of hinge members each consisting essentially of a flexible polymeric film articulately interconnecting adjacent profiled members of the plurality of profiled members longitudinally along only adjacent lateral edges of said bases,

wherein each said at least one tambour door element is comprised of plastic materials coextruded as an interconnected unit.

5,065,809

METHOD FOR CASTING TITANIUM OR TITANIUM-BASED ALLOY

Takashi Sato, 3-23, Nishitaga 1-Chome, Sendai-Shi, Miyagi; Yoji Iwanabe, Miyagi; Koji Arato, Miyagi; Rokuro Sakagami, Miyagi, and Yasuo Yoneda, 910, Chokeiji, Takaoka-Shi, Toyama, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo; Yasuo Yoneda, Takaoka and Takashi Sato, Sendai, all of, Japan

Filed May 28, 1991, Ser. No. 676,318

Int. Cl.[5] B22D *27/16*

U.S. Cl. 164—61 **4 Claims**

1. A method for the production of a cast of titanium or a titanium-based alloy by fusing titanium or a titanium-based alloy containing an alloy element in a vacuum furnace while introducing argon gas into said vacuum furnace and casting the resultant melt, which method comprises providing the following relationships for the argon gas pressure (atm) in said vacuum furnace in accordance with the content, M (% by weight), of said alloy element:

Not less than 2.1 when $0 \leqq M < 5$

Not less than 1.6 when $5 \leqq M < 10$

Not less than 1.5 when $10 \leqq M < 15$

Not less than 1.2 when $15 \leqq M$; determining said content, M, of said alloy element; and adjusting the introduction of said argon gas in accordance with said content, M, of said alloy element.

5,065,810

METHOD OF PRODUCING MECHANICAL PARTS BY MOLD CASTING

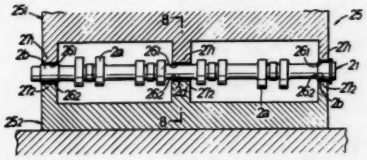
Masatoshi Kawaguchi; Norio Tajima; Setsumi Hatanaka; Hiroshi Yoshinaga; Masahiro Inoue; Tadao Nagaoka; Hiromu Okunishi; Masaaki Kurosawa; Hideaki Ikeda; Takeshi Ooba; Nobuki Matsuo, and Hiroshi Onda, all of Sayama, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Division of Ser. No. 143,625, Jan. 13, 1988, Pat. No. 4,971,134. This application Sep. 17, 1990, Ser. No. 583,965

Claims priority, application Japan, Jan. 12, 1987, 62-4629; Jan. 12, 1987, 62-4630; Feb. 12, 1987, 62-19077; Jul. 22, 1987, 62-183151; Aug. 6, 1987, 62-120636; Aug. 21, 1987, 62-207944; Sep. 18, 1987, 62-234640; Sep. 18, 1987, 62-234641; Sep. 21, 1987, 62-236598

Int. Cl.[5] B22D *29/00*

U.S. Cl. 164—76.1 **4 Claims**



1. A method for producing a mechanical part, comprising die casting a metal mechanical part in a mold, rapidly cooling said cast mechanical part, said rapid cooling being effected at the surface of the cast part in contact with said mold, and releasing the cast part from said mold when a solidified layer has been formed at the surface of the cast part, and applying pressure to said mechanical part while the part is still at a relatively high temperature immediately after release of the part from the mold.

5,065,811

APPARATUS FOR THE MANUFACTURE OF HOT ROLLED STEEL STRIP

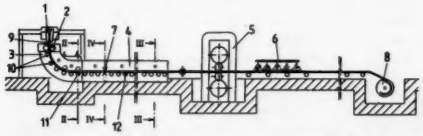
Heinrich Scholz, Klopstock, and Rudolf Guse, Portmannweg, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 440,341, Nov. 22, 1989, abandoned. This application Dec. 17, 1990, Ser. No. 630,340

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1988, 3839954

Int. Cl.[5] B22D *11/12, 11/126*

U.S. Cl. 164—460 **28 Claims**



1. Apparatus for the manufacture of hot rolled steel strip comprising:

a mold for the continuous casting of steel strip including cooled walls defining a substantially vertical passage having an outlet end;

a strip guiding device located adjacent said outlet end including means for diverting steel strip issuing downwardly from said outlet end into a substantially horizontal plane;

curved temperature equalization means surrounding said strip diverting means, said curved temperature equalization means positioned adjacent to said outlet end to receive said strip as said strip exiting from said mold and extending the entire length of said strip guiding device, said curved temperature equalization means having means defining a first environment enclosing said steel strip and means external to said first environment for adding heat to said first environment so that said strip is maintained at a predetermined temperature profile starting substantially at said mold outlet end and continuing during its passage through said curved temperature equalization means;

substantially horizontal strip transfer means adapted to receive steel strip from said strip guiding device;

straight temperature equalization means surrounding at least the portion of said strip transfer means adjacent said strip guiding device, said straight temperature equalization means positioned substantially adjacent to the outlet end of said curved temperature equalization means and extending the entire length of said strip transfer means, said straight temperature equalization means having means defining a second environment enclosing said steel strip and means external to said second environment for adding heat to said second environment so that said strip is maintained at a predetermined temperature profile during its passage through said straight temperature equalization means;

crosscutting means adapted to sever said steel strip within said straight temperature equalization means; and,

a rolling mill adapted to receive said steel strip from said strip transfer means.

17. A method for hot rolling steel strip comprising the steps of:

A. continuously casting steel strip in a strip casting mold having a vertical passage therethrough to form a steel strip which is sufficiently thin that the strip substantially solidifies upon exiting said passage;

B. diverting the strip exiting from said passage into a horizontal plane within a curved temperature equalization means, said curved temperature equalization means being positioned adjacent to said passage to receive said strip as said strip exiting from said mold and having means defining a first environment enclosing said steel strip;

adding heat to said first environment so that said strip is maintained at a predetermined temperature profile starting at the outlet end of said mold passage and continuing during its passage through said curved temperature equalization means;

D. conveying said diverted strip through a straight temperature equalization means, said straight temperature equalization means having means defining a second environment enclosing said steel strip;

E. adding heat to said second environment so that said strip is maintained at a predetermined temperature profile during its passage through said straight temperature equalization means;

F. crosscutting said strip along a line normal to its direction of travel within said straight temperature equalization means; and

G. rolling said crosscut lengths of strip in a rolling mill.

5,065,812

PROCESS FOR THE TWIN-ROLL TYPE, CONTINUOUS CASTING OF METAL SHEETS

Toshiaki Mizoguchi, and Kenichi Miyazawa, both of Futtsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 578,305

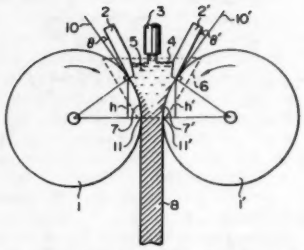
Claims priority, application Japan, Sep. 11, 1989, 1-232910

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—480 **6 Claims**

1. A process for the twin-roll type, continuous casting of metal sheets, which comprises supplying a molten metal into the clearance between a pair of rolls, provided with control plates, respectively, solidifying the supplied molten metal and rolling the solidified molten metal, thereby producing cast pieces in a sheet form, the casting being carried out under a condition given by the following equation:

$u \geqq d/a$



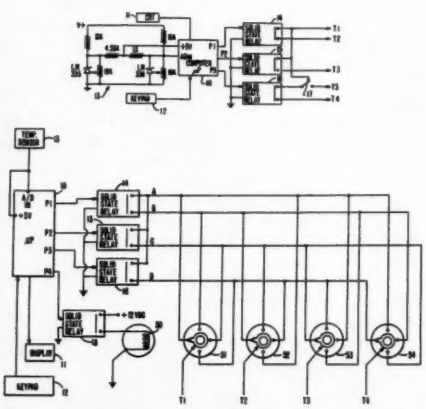
wherein u is a roll surface speed (m/sec), d is a thickness of the lower edge of each of control plates (mm) and a is a coefficient depending upon the species of molten metal.

5,065,813

INTERACTIVE ELECTRONIC THERMOSTAT WITH INSTALLATION ASSISTANCE

Arnold D. Berkeley, 10687 Weymouth St., Apt. 102, Bethesda, Md. 20814; Alec Bernstein, and Daniel C. Carney, both of Baltimore, Md., assignors to Arnold D. Berkeley, Bethesda, Md.

Filed Dec. 9, 1988, Ser. No. 282,319
Int. Cl.[5] F25B *29/00, 49/00*
U.S. Cl. 165—1 **32 Claims**



10. A method for automatically interacting between an electronic thermostat and an installer for the purpose of effecting proper electrical connections required at the thermostat for a plurality of wires of a temperature-modifying apparatus controlled by the thermostat, said thermostat including means for automatically structuring said thermostat for proper operation of said apparatus with connections of said wires to said thermostat, said method comprising the steps of:

requesting and receiving entry of installer-initiated indications into said thermostat;

providing a plurality of sequential instructional prompts in a commonly spoken language to instruct the installer to follow respectiev steps to effect proper operation of said apparatus for the electrical connections of said plurality of wires at said thermostat, said prompts also including instructions to the installer to enter installer-observed responses of said apparatus; and

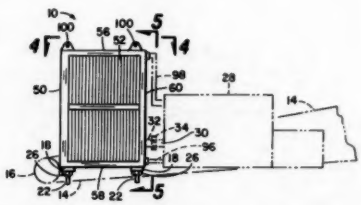
causing said structuring means to automatically structure said thermostat for proper operation of said apparatus with connections of said wires in response to entered installer-observed apparatus responses.

5,065,814

REDUCED NOISE MODULAR COOLING SYSTEM

Frederick W. Loeber, Tulsa, and George O. Greene, Glenpool, both of Okla., assignors to Terex Corporation, Green Bay, Wis.

Filed Nov. 1, 1990, Ser. No. 607,915
Int. Cl.[5] F01P *5/02;* **B60K** *11/04*
U.S. Cl. 165—41 **4 Claims**



1. A modular cooling system for a large engine powered machine having a machine frame, comprising:

an upright modular superstructure having a horizontal bottom, a horizontal top, opposed vertical sides, a vertical front and a vertical rear;

means to removably mount said superstructure on a machine frame whereby the superstructure front is oriented in the forward direction of travel of the machine;

vertical air cooled radiator portions affixed to said superstructure front and opposed sides;

a floor closing said superstructure bottom;

a hood closing said superstructure top;

a vertical fan panel closing said superstructure rear, the panel having at least one fan shroud opening therein, a plenum chamber being thereby formed within said superstructure;

a fan rotatably supported by said superstructure within each said at least one fan shroud opening in said fan panel, air being expelled from said plenum chamber by and through said fan to create a reduced differential air pressure within said plenum chamber, air flowing into said plenum chamber through each of said three radiator portions, the differential air pressure within said plenum chamber being equally applied to each of said three radiator portions;

means connected to the machine engine for driving each said fan to evacuate air from said plenum chamber; and

means for circulating at least one fluid from the machine engine through said radiator portions.

5,065,815

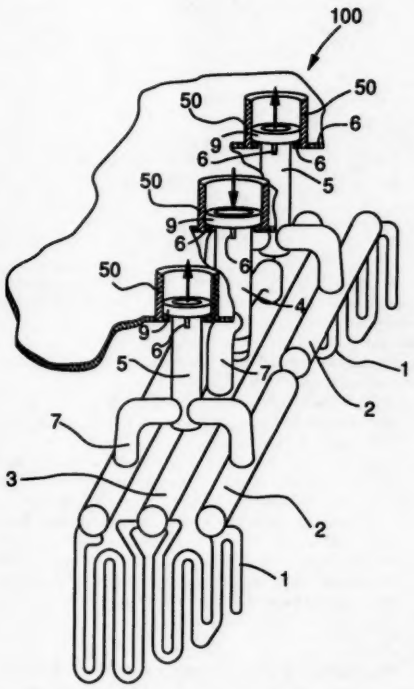
FORCE FREE SUSPENSION OF HEAT EXCHANGE BUNDLES WITH HIGH TEMPERATURE ADMISSION FLOW

Helmut David; J. Ernst Malik, and Rainer Schmidt, all of Oberhausen, Fed. Rep. of Germany, assignors to Man Gutehoffnungshütte Aktinegesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 24, 1990, Ser. No. 602,794
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935871
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—67 **6 Claims**

1. A heat exchanger arranged in a horizontally positioned container for carrying extremely hot gaseous or vapor media comprising:

a heat exchanger unit including a bank of tubes defined by tube walls, an inlet port, a collector connected to said inlet port and connected to said tubes, an outlet port, first and second outlet port collectors each outlet port collector being connected to said outlet port and connected to said tubes; and bracket suspension means connected to passages of said container for suspendedly supporting each of said inlet port and said outlet port and connected bank of tubes.

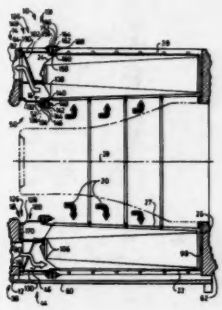


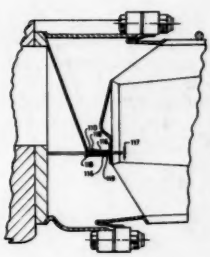
5,065,816

SEALING SYSTEM FOR A CIRCULAR HEAT EXCHANGER

Charles T. Darragh, San Diego, Calif., assignor to Solar Turbines Incorporated, San Diego, Calif.

Filed May 29, 1990, Ser. No. 530,954
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—125 **25 Claims**





22. The heat exchanger of claim **21** wherein said manifold further includes a continuous seal interwoven between the plurality of inlet and outlet ports.

5,065,817

AUGER TYPE ICE FLAKING MACHINE WITH ENHANCED HEAT TRANSFER CAPACITY EVAPORATOR/FREEZING SECTION

Robert J. Alvarez, Denver; Tom N. Martineau, Aurora, and Steven D. VanderBurgh, Boulder, all of Colo., assignors to Mile High Equipment Company, Denver, Colo.

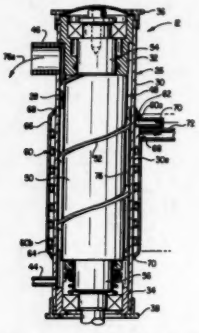
Division of Ser. No. 443,019, Nov. 29, 1989, which is a continuation of Ser. No. 257,770, Oct. 14, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 533,160
Int. Cl.[5] F28D *1/02*
U.S. Cl. 165—153 **6 Claims**

1. A method of transferring heat between a first pipe and fluid flowing through a second pipe, said method comprising the steps of:

substantially roughening an outer side surface portion of a first pipe to create relatively small, laterally outwardly projecting sections;

tightly wrapping a second pipe around the outer surface portion of the first pipe, the second pipe being pressed

firmly against the laterally projecting sections on the outer side surface of the first pipe in a manner substantially increasing surface-to-surface contact area, and thus the heat transfer rate, between the first pipe and the second



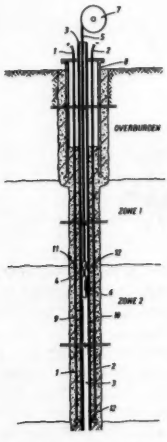
pipe, and creating a substantial gripping force between the outer side surface portion of the first pipe and the second pipe which materially inhibits movement of the second pipe relative the first pipe.

5,065,818

SUBTERRANEAN HEATERS

Cornelis F. H. Van Egmond, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 7, 1991, Ser. No. 637,859
Int. Cl.[5] E21B *36/04*
U.S. Cl. 166—60 **10 Claims**



1. A subterranean heater with a well borehole in a formation to be heated, the heater comprising:

a) at least one electrically resistive core;

b) mineral insulation surrounding the core;

c) a sheath surrounding the mineral insulation;

d) cement securing the sheath in the well borehole, wherein a casing is not present within the well borehole in the formation to be heated; and

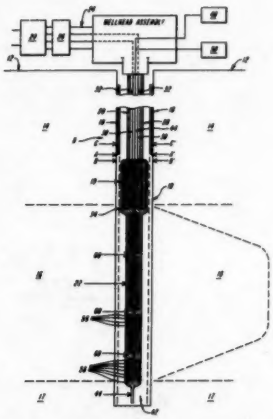
e) a means to supply electrical power through the electrically resistive core.

5,065,819

ELECTROMAGNETIC APPARATUS AND METHOD FOR IN SITU HEATING AND RECOVERY OF ORGANIC AND INORGANIC MATERIALS

Raymond S. Kasevich, Weston, Mass., assignor to KAI Technologies, Woburn, Mass.

Filed Mar. 9, 1990, Ser. No. 491,005
Int. Cl.[5] E21B *36/04, 43/24*
U.S. Cl. 166—248 **34 Claims**



1. An apparatus for processing and extracting organic or inorganic materials from a subsurface formation wherein electromagnetic energy is transmitted from a radio frequency generator through a coaxial transmission line to a radio frequency antenna inserted in a borehole in said subsurface formation, said apparatus comprising:

a radio frequency antenna for radiating energy into said subsurface formation, said antenna having a plurality of apertures in a distal section;

a production flow line for connecting a material collection region of said borehole to a storage facility;

lifting means in operative connection with said production flow line for transferring said materials from said material collection region to said storage facility; and

a coaxial dielectric liquid impedance transformer provided for quarter-wave impedance matching between said radio frequency generator and said antenna.

5,065,820

CONTROL OF LOST CIRCULATION IN WELLS

James B. Bloys, Plano, and Bonsall S. Wilton, McKinney, both of Tex., assignors to Atlantic Richfield Company, Los Angelels, Calif.

Filed Oct. 9, 1990, Ser. No. 594,252
Int. Cl.[5] E21B *33/138*
U.S. Cl. 166—291 **12 Claims**

1. A method of controlling lost circulation of fluid from a wellbore into passages of a formation penetrated by said wellbore, said method comprising:

flowing a treating mixture down said wellbore and into said passages of said formation, said treating mixture comprising:

a non-aqueous carrier fluid;

a first lost circulation material comprising particles of sponge-like material which expands upon contact with an aqueous fluid; and

a second lost circulation material.

8. A mixture for controlling lost circulation of fluids from a wellbore comprising:

a non-aqueous carrier fluid;

a first lost circulation material comprising particles of

sponge-like material which expands upon contact with an aqueous fluid; and

a second lost circulation material.

5,065,821

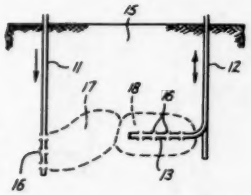
GAS FLOODING WITH HORIZONTAL AND VERTICAL WELLS

Wann-Sheng Huang, Houston, and Jack J. Hsu, Stafford, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 11, 1990, Ser. No. 463,704

Int. Cl.[5] E21B *43/00*

U.S. Cl. 166—245 **8 Claims**



1. A method of producing hydrocarbons from a portion of an underground formation bounded by at least one substantially vertical well and at least one well having both a vertical wellbore and a horizontal wellbore, comprising:

injecting a gas into the formation through a first substantially vertical injection well;

performing concurrently with the gas injection through the vertical injection well at least one cycle of gas injection, soak, and production through a horizontal wellbore of a combination vertical and horizontal well;

said horizontal wellbore extending from the vertical wellbore of the combination well about one-third to about two-thirds of the distance to the first substantially vertical injection well;

after the gas injected through the first substantially vertical injection well reaches the portion of the formation affected by the gas injected and produced through the horizontal wellbore, converting the first substantially vertical injection well to a first substantially vertical production well;

setting a production pump relatively near the bottom of the first production well;

injecting gas continuously through perforations in the vertical wellbore of the combination vertical and horizontal well relatively near the bottom of the vertical wellbore; and

producing gas and hydrocarbons from the first substantially vertical production well.

5,065,822

CROSSLINKING WATER SOLUBLE POLYMERS WITH IRON TO FORM GELS FOR USE IN SUBTERRANEAN PROFILE MODIFICATION

Edward E. Miller, Plano Collin, Tex., and Peter J. Strydom, Morriston, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 14, 1990, Ser. No. 582,068

Int. Cl.[5] E21B *33/138*; E02D *3/12*

U.S. Cl. 166—295 **9 Claims**

1. In a method for altering the permeability of at least a portion of a subterranean formation wherein a fluid gelable composition is passed into the formation to a preselected location and the composition is gelled to modify the fluid flow profile of said portion of the formation, the improvement comprising using as the fluid gelable composition a composition comprising:

(a) water

(b) a water-thickening and cross-linkable amount of a water-dispersible polysaccharide or a polymer consisting essentially of:

(i) from about 3 to 100 mole percent of acrylic monomer units or salts thereof and

(ii) from about 97 to 0 mole percent of other water-soluble monomer units or salts thereof and

(c) an amount of a polyvalent metal capable of cross-linking said polymer to form a stable gel, said polyvalent metal being provided in the form of a redox couple, said redox couple comprising (iii) at least one water-soluble ferrous reducing agent capable of being oxidized to a higher valence state and (iv) an oxidizing agent effective to oxidize ferrous ion to ferric ion whereby said polyvalent metal is in situ produced in the form of ferric ion by oxidation of said reducing agent by said oxidizing agent.

5,065,823

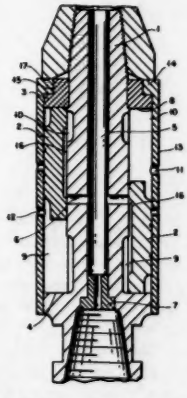
EXTRACTION DEVICE FOR PNEUMATICALLY ACTUATED DRILLING TOOLS

Abraham Glen, and Bernard L. Glen, both of P.O. Box 471, Edenvale, 1610 Transvall, South Africa

Continuation of Ser. No. 414,724, Sep. 29, 1989, abandoned, which is a continuation of Ser. No. 31,378, Mar. 30, 1987, abandoned. This application Jan. 14, 1991, Ser. No. 640,571

Int. Cl.[5] E02D *9/00*

U.S. Cl. 173—91 **21 Claims**



1. An extracting device for use in extracting a drill rod and a drilling tool from a borehole, comprising:

a hammer carrier having at one end means for connecting it to a drill rod section, said carrier including an annular striking surface remote from said connecting means and having an axial bore for conveying activating fluids;

an annular hammer having upper and lower ends reciprocably movable with respect to the carrier between a striking position adjacent said striking surface and a position removed therefrom;

fluid flow paths including a lateral port in said carrier extending through the wall of said carrier from the axial bore for conveying the activating fluid to said hammer to cause reciprocation, momentum of said hammer on striking the striking surface in use being transmitted to said drill rod to urge said drill rod and the drilling tool out of the borehole; and

a sleeve surrounding said hammer and defining upper and lower chambers between inner walls of said sleeve, said hammer carrier, and said upper and lower ends of said hammer respectively, said fluid flow paths including a recess in the inner wall of the hammer and a recess in the outer wall of said carrier on each side of the lateral port for directing fluid in use to either said upper or said lower chamber, depending upon the position of the hammer, and

said sleeve having at least one exhaust port opening outwardly through the wall thereof and being free of an intake port;

said annular striking surface being provided by a collar held on said carrier by said sleeve and against a shoulder on said carrier by a flange on the end of the sleeve engaging in a recess provided in the outer surface of the collar.

5,065,824

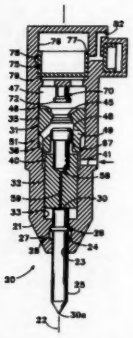
HYDRAULICALLY POWERED REPETITIVE IMPACT HAMMER

Jack B. Ottestad, La Jolla, Calif., assignor to Esco Corporation, Portland, Oreg.

Filed Dec. 28, 1989, Ser. No. 457,479

Int. Cl.[5] B25D *9/18*; F01L *15/12*

U.S. Cl. 173—134 **5 Claims**



5. In an impact hammer of the type having a frame and a hammer head slidably mounted within said frame so as to move along a predetermined axis, said hammer head having respective first and second pressure surfaces located on opposite sides thereof transverse to said axis, a chamber within said hammer head communicating with a poppet port formed in said first pressure surface of said hammer head, a poppet slidably mounted within said chamber so as to move along said axis between respective positions closing or opening said poppet port, said poppet port enabling communication between said second pressure surface and said first pressure surface of said hammer head when said poppet port is open and preventing said communication when said poppet port is closed, respective further first and second pressure surfaces located on opposite sides of said poppet transverse to said axis, a compression chamber within said frame exposed to the first pressure surface of said hammer head and the first pressure surface of said poppet, respectively, inlet means for admitting pressurized fluid to the second pressure surface of said hammer head and the second pressure surface of said poppet, respectively, outlet means for discharging excess fluid, and means for receiving an impact tool for reciprocal movement in the frame so as to be struck by said hammer head, the improvement comprising:

means for braking the movement of said hammer head comprising means responsive to the slidable position of the hammer head within said frame for selectively enclosing fluid in a confined space in response to said hammer head reaching a predetermined position while moving toward said impact tool, said confined space communicating with the second pressure surface of said poppet for exerting pressure thereon and thereby causing said poppet to substantially close said poppet port in response to said hammer head reaching said predetermined position.

5,065,825

METHOD AND DEVICE FOR REMOTE-CONTROLLING DRILL STRING EQUIPMENT BY A SEQUENCE OF INFORMATION

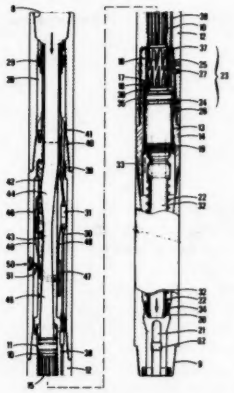
Christian Bardin; Guy Pignard, both of Rueil Malmaison; Jean Boulet, Paris, and Pierre Morin, Levallois Perret, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 29, 1989, Ser. No. 459,282

Claims priority, application France, Dec. 30, 1988, 88 17604

Int. Cl.[5] E21B *47/12*

U.S. Cl. 175—38 **12 Claims**



1. A method of controlling drill string equipment extending within a bore hole from a first location on the surface of the earth to a second location beneath the surface of the earth, said method comprising:

issuing from the first location a control sequence to cause a first predetermined action in a first portion of the drill string;

detecting in a second portion of the drill string a condition resulting from the first predetermined action;

comparing the detected condition with a predetermined condition; and

when the detected condition meets or exceeds the predetermined condition, causing a second predetermined action in a third portion of the drill string.

5,065,826

APPARATUS FOR OPTIONAL STRAIGHT OR DIRECTIONAL DRILLING UNDERGROUND FORMATIONS

Volker Kruger, Celle, and Rolf Panzke, Blenhorst, both of Fed. Rep. of Germany, assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 281,975, Nov. 30, 1988, abandoned, which is a continuation of Ser. No. 145,055, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 910,286, Sep. 17, 1986, Pat. No. 4,739,842, which is a continuation of Ser. No. 731,181, May 6, 1985, abandoned. This application Oct. 10, 1989, Ser. No. 418,970

Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417743; May 12, 1984, 8414613; Jun. 26, 1984, 3423465

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

Int. Cl.[5] E21B *7/06, 4/02*

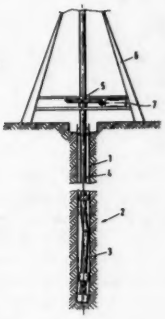
U.S. Cl. 175—75 **2 Claims**

1. A downhole assembly for use in an earth drilling operation, said downhole assembly adapted for use in a drilling system in which the downhole assembly is coupled to a drill

string and may be selectively rotated, said downhole assembly comprising,

a substantially rigid housing assembly, said housing assembly including an upper section and a lower section, each said section having a longitudinal axis, said housing having at least one bend which establishes a predetermined angle of deflection between said upper housing section and said lower housing section;

a downhole motor mounted in said housing assembly, said downhole motor mounted at least partially in said upper housing section, said downhole motor having an output shaft;



a drill bit coupled to said output shaft of said downhole motor, said drill bit having a longitudinal axis;

a first concentric stabilizer coupled to said housing assembly, said first stabilizer being generally aligned with said longitudinal axis of said drill bit; and

a second concentric stabilizer mounted to the upper section of said housing assembly, said second concentric stabilizer being axially aligned with said drill string, said downhole assembly having no additional stabilizers located intermediate said first and second concentric stabilizers.

5,065,827

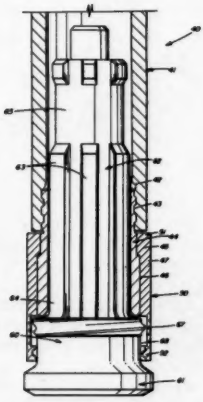
HAMMER BIT RETENTION TOOL

John A. Meyers, New Iberia, La.; David E. Drake, Roscoe, Tex., and Charles W. Witt, Fort Smith, Ark., assignors to Smith International, Inc., Houston, Tex.

Filed Dec. 21, 1990, Ser. No. 632,266

Int. Cl.[5] E21B *10/36*

U.S. Cl. 175—414 **11 Claims**



1. A hammer-percussion bit assembly connected to the lower end of a drill string for earth boring operations comprising:

a hammer assembly for imparting kinetic energy to a percussion bit;

a percussion bit having a shank portion mounted within said hammer assembly and a head section extending out of the lower end of said hammer assembly; and

means for retaining the head section of said bit to the assembly during operation and thereafter, should the head section fracture and separate from the shank section.

5,065,828

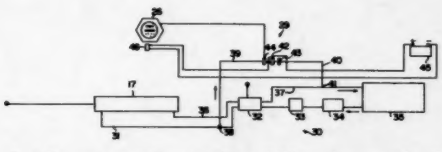
HYDRAULIC CONTROL SYSTEM FOR WEIGHING

Ronald Smith, Narrabeen, Australia, assignor to Wray-Tech Instruments, Inc., Downers Grove, Ill.

Filed Mar. 5, 1990, Ser. No. 488,679

Int. Cl.[5] G01G *19/08, 19/10, 5/04, 13/00*

U.S. Cl. 177—139 **7 Claims**



1. A bypass control system for reliably and accurately obtaining a weighing signal from a transducer responsive to hydraulic fluid pressure in the hydraulic system of a lift assembly operated by a main control valve means, the bypass control system comprising:

a tap-off connection to a lift circuit of the hydraulic system of a lift assembly;

a bypass line fluidly communicating with the tap-off connection and extending therefrom to bypass said main control valve means;

a pressure responsive transducer means along said bypass line;

a second valve means being a normally closed remote control valve along said bypass line means; and,

a return line means for returning hydraulic fluid to the hydraulic circuit of said lifting assembly separately from said main control valve means.

5,065,829

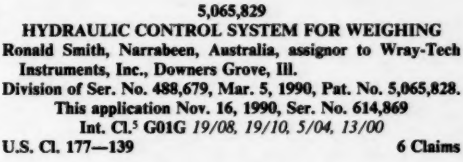
HYDRAULIC CONTROL SYSTEM FOR WEIGHING

Ronald Smith, Narrabeen, Australia, assignor to Wray-Tech Instruments, Inc., Downers Grove, Ill.

Division of Ser. No. 488,679, Mar. 5, 1990, Pat. No. 5,065,828. This application Nov. 16, 1990, Ser. No. 614,869

Int. Cl.[5] G01G *19/08, 19/10, 5/04, 13/00*

U.S. Cl. 177—139 **6 Claims**



1. A motion control method for generating reliable analog electrical signals from a pressure transducer means and providing analog signals responsive to hydraulic fluid pressure caused by lifting a weight by means of an hydraulic lift assembly of a refuse collection vehicle, said method comprising the steps of:

tapping off hydraulic fluid under pressure from the lift circuit of an hydraulic lift assembly of a refuse collection vehicle;

bypassing said tapped off hydraulic fluid through an hydraulic bypass circuit;

lowering a weight lifted by the hydraulic lift assembly;

directing said tapped-off hydraulic fluid to hydraulic pressure transducer means sensing the pressure in the hydraulic bypass circuit and generating an analog electrical signal corresponding to the weight being lowered by said hydraulic lift assembly;

communicating said analog signal to an analog/digital converter means; and,

creating a digital record of the weight.

5,065,830

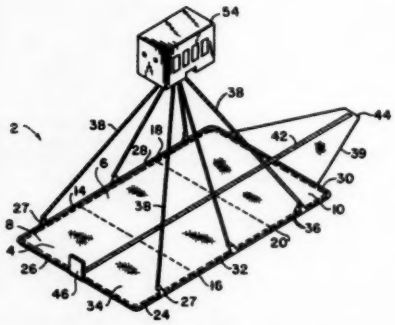
PORTABLE APPARATUS TO WEIGH AND MEASURE INFANTS

Steven Stevenson, P.O. Box 12, Wingdale, N.Y. 12545

Filed Feb. 7, 1991, Ser. No. 652,000

Int. Cl.[5] G01G *21/22*

U.S. Cl. 177—263 **8 Claims**



1. Apparatus for conveniently and safely weighing and measuring an infant, said apparatus comprising a foldable cloth material bed having a head section, a central section and a foot section, a foldable peripheral frame for said bed, said cloth being secured to said frame at a periphery of said cloth, said frame having paired hinges for folding said bed inwardly only along transverse lines between said head and central section and between said central section and said foot section, length measuring means on an upper surface of said bed along a longitudinal axis thereof, a foldable head panel at an outer end edge of said head section of said bed for placing an infant's head against, pairs of cords secured at one end to opposite side edges of said bed frame on each of the head, central and foot sections, with other ends of said cords detachably secured to a bar holder which is connected to a weighing scale from which said bed is suspended when weighing an infant.

5,065,831

MOUNTING ARRANGEMENT FOR FINAL DRIVE UNIT FOR AUTOMOTIVE VEHICLES

Shinichi Murakami, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 23, 1990, Ser. No. 527,475

Claims priority, application Japan, May 23, 1989, 1-129891

Int. Cl.[5] B60K *5/02, 17/04, 17/34*

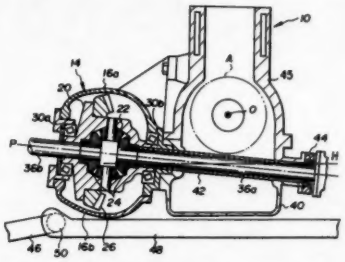
U.S. Cl. 180—55 **7 Claims**

1. A power drive arrangement for an automotive vehicle having a longitudinally mounted engine and an oil pan mounted or integral with the engine, said arrangement comprising:

a pair of axle shafts;

a sleeve for receiving therein one of said pair of axle shafts, said sleeve extending through said oil pan substantially perpendicular to the longitudinal direction of the engine and being inclined at a predetermined angle relative to a horizontal axis of the engine;

means formed in said oil pan for permitting said sleeve to pass therethrough and for permitting said sleeve to be inclined about the horizontal axis; and



an enclosure for receiving therein and rotatably supporting a differential unit, said enclosure being adjacent the engine and fixedly connected to the oil pan, said differential unit engaging an end portion of each of said axle shafts, said differential unit and said enclosure being coaxially positioned about said axle shafts whereby said differential unit and said enclosure is inclined at the same angle as said sleeve.

5,065,832

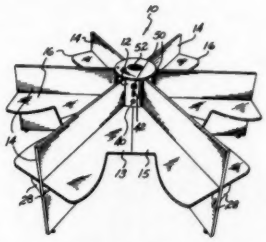
MULTIPLE SECTION WORK STATION

Edward H. Mark, South Bend, Ind., assignor to Packard Industries, Inc., Niles, Mich.

Filed Nov. 2, 1987, Ser. No. 115,818

Int. Cl.[5] A47B *57/00*

U.S. Cl. 108—60 **6 Claims**



1. In a work station having multiple work sections separated by partition walls, the improvement comprising a central core member, said partition walls detachably fastened to said core member at spaced locations and extending outwardly from the core member to define said work sections, each work section including desk top means for supporting working utensils, and means associated with one of said core member and partition walls for supporting said desk top means above a floor, said core member including an internal fan means for drawing ambient air into the core member, said core member further including vent means positioned adjacent each work section for selectively delivering ambient air to each work section.

5,065,833

GROUND-SURFACE-EFFECT WING PLANE

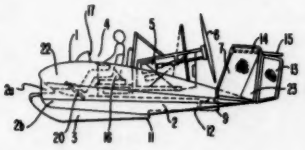
Toshio Matsuoka; Akio Higashida, and Tokuki Satake, all of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1990, Ser. No. 556,253

Claims priority, application Japan, Jul. 31, 1989, 1-196507; Jan. 31, 1990, 2-21206

Int. Cl.[5] B60V *1/08*

U.S. Cl. 180—117 7 Claims



1. A ground-surface-effect winged craft comprising: an airframe including a main body portion in the shape of an airfoil, a float portion defined at a central lower portion of said main body portion of the airframe and imparting buoyancy to the airframe when the craft rests on a body of water, an operator's seat located at a central upper portion of said main body portion above said float portion, side plates extending generally vertically at opposite lateral sides of said main body portion, respectively, the side plates inhibiting air from flowing laterally outwards from the underside of said main body portion, floats located at said side plates, a generally vertically extending tail portion located at the rear of said main body portion, and a generally horizontally extending tail portion located at the rear of said main body portion, said generally horizontally extending tail portion including a stabilizer and an elevator; and propelling means for producing an air flow that will both create a power augmented ramwing effect with said generally horizontally extending tail portion and a thrust on the airframe sufficient to generate a ground-surface-effect between said main body portion and a flat surface such as the surface on which the craft rests, said propelling means including a propeller rotatably supported on said airframe about an axis of rotation, said propeller located adjacent to said generally horizontally extending tail portion with said axis of rotation thereof extending substantially at the level at which said stabilizer is disposed so as to facilitate the production of said power augmented ramwing effect.

5,065,834

DRIVING WHEEL SLIP CONTROL SYSTEM HAVING FAILSAFE FUNCTION

Kazuo Hirabayashi; Tetsuya Oono; Eitetsu Akiyama; Yukihisa Ishii; Shigenobu Sekiya, and Yuji Fujimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1990, Ser. No. 553,041

Claims priority, application Japan, Jul. 17, 1989, 1-83898[U]; Jul. 17, 1989, 1-83899[U]; Jul. 17, 1989, 1-83900[U]; Jul. 17, 1989, 1-83901[U]; Jul. 17, 1989, 1-83904[U]

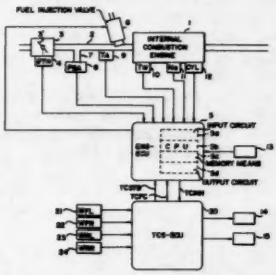
Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 18 Claims

3. In a driving wheel slip control system which is installed in a vehicle having driving wheels, for controlling a slip of said driving wheels, said vehicle having a prime mover installed therein for driving said driving wheels, said system including slip status signal-generating means for detecting an excessive slip state of said driving wheels and generating a slip status signal indicative of whether or not said driving wheels is in a predetermined slip state, slip level signal-generating means for generating a slip level signal indicative of a degree of slip of said driving wheels, and abnormality-determining means for determining that said slip status signal is abnormal when a logical relationship between said slip status signal and said slip level signal is abnormal;

the improvement comprising:

prime mover operating condition-determining means for determining whether or not said prime mover is accelerating when said abnormality-determining means determines that said slip status signal is abnormal; and



control inhibiting means for causing slip control of said driving wheels responsive to said slip level signal to be continued until it is determined that said prime mover is in an operating condition other than acceleration, and inhibiting said slip control of said driving wheels thereafter while said prime mover is in said operating condition other than acceleration.

5,065,835

MOTOR VEHICLE WITH WHEELS DRIVEN VIA DIFFERENTIAL GEARING OR THE LIKE

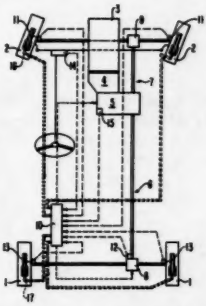
Karl-Heinz Richter, Kernen; Gerhard Rollmann, Tamm; Helmut Struck, Winnenden, and Gerd Eilert, Schwaikheim, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Nov. 14, 1989, Ser. No. 435,995

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1988, 3840004

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 18 Claims



1. A motor vehicle having wheels driven via differential gearing, sensors for detecting wheel rotational-speed, and means for forcedly achieving synchronism between the wheels, said means being automatically actuated for predeterminable holding periods when rotational-speed differences exceed predeterminable threshold values and configured for repeated actuation when new occurrences of the predetermined threshold values of the rotational-speed differences are detected, wherein said repeated actuations automatically take place in one of two states comprising successively extended holding periods and on occurrence of successively lowered threshold values if time intervals between occurrences of said

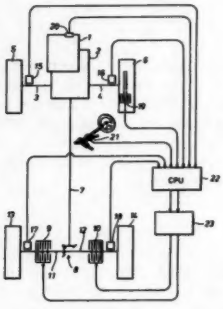
threshold values and respectively preceding actuations of said synchronism means decrease as a first state, and on occurrences of successively lowered threshold values if time intervals between occurrences of said threshold values and respectively preceding actuations of said synchronism means decrease as a second state.

5,065,836

FOUR-WHEEL DRIVE MOTOR VEHICLE HAVING A CONTROLLED DIFFERENTIAL DEVICE

Tetsuro Hamada; Yoshiki Noro, and Noboru Ashikawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 175,827, Mar. 31, 1988, Pat. No. 4,921,065. This application Apr. 30, 1990, Ser. No. 516,378
Claims priority, application Japan, Mar. 31, 1987, 62-079281
Int. Cl.[5] B60K *17/354*
U.S. Cl. 180—245 26 Claims



1. A motor vehicle having a first axle shaft driven by a drive source and a second axle shaft which is driven by the same drive source, each of a pair of wheels associated with the second axle shaft being powered by way of individual variable torque transmitting means, further comprising:

a speed sensor for detecting a vehicle speed; and

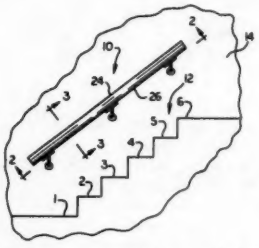
control means for increasing the torque transmission ratios of the two variable torque transmitting means when the speed sensor has detected that the vehicle is stationary such that necessary vehicle traction can be obtained when the vehicle is starting off.

5,065,837

HANDRAIL FOR AIDING VISUALLY HANDICAPPED

Katherine A. Szudy, 6995 Edgecliff Dr., Parma, Ohio 44134

Filed Feb. 5, 1991, Ser. No. 650,907
Int. Cl.[5] G09B *1/00;* E06C *5/34*
U.S. Cl. 182—18 3 Claims



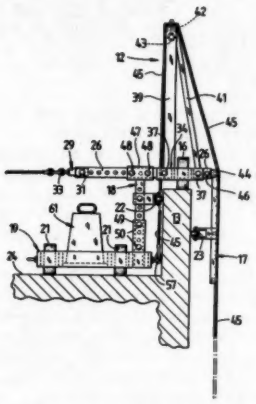
1. An apparatus for use in aiding a visually handicapped person in moving up and down stairs, said apparatus comprising a handrail extending along the stairs, and indicia on said handrail identifying steps along which said handrail extends, said indicia being in the braille system and including characters which project outwardly from said handrail for a distance sufficient to enable the characters of said indicia to be felt by human fingers.

5,065,838

MOVABLE SUPPORT FOR WINDOW WASHERS AND THE LIKE

Arthur C. Finley, 2742 Stonefield Dr., Fultondale, Ala. 35068

Filed Aug. 29, 1990, Ser. No. 574,059
Int. Cl.[5] E04G *3/10, 3/14*
U.S. Cl. 182—38 20 Claims



1. An apparatus used in conjunction with a rope and a harness for a window washer washing windows along the side of a building having a parapet wall thereon comprising:

(a) a movable support frame supported on the roof and parapet wall of the building with said frame directing the line of action of a force applied by the weight of a window washer substantially downwardly into the parapet wall;

(b) means mounted to said support frame for guiding said support frame along the parapet wall; and

(c) a ladder mounted to said support frame allowing the window washer to step over and descend the parapet to begin cleaning.

5,065,839

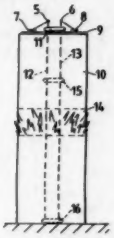
ESCAPE SYSTEM

George W. Napier, 19 Hadrian Court, Darras Hall, Ponteland, Newcastle-upon-Tyne NE20 9JU, England

Filed Jun. 12, 1989, Ser. No. 365,931
Claims priority, application United Kingdom, Jun. 14, 1988, 8814101
Int. Cl.[5] H62B *1/02*
U.S. Cl. 182—47 8 Claims

1. An escape system for enabling occupants to escape from the upper levels of a building, comprising lift means selected from the group consisting of davits and cranes mounted at a position located at an upper level of said building, at least two fire-resistant cables depending from said lift means, a fire-resistant substantially air-tight vessel of a smooth external generally rounded shape to minimize the effect of wind, said vessel being attached to the respective cables at spaced-apart points on said vessel, which is suspended at the upper levels of said building, bridge means pivotally attached to said vessel for pivoting between a first position in which the bridge means is stowed when not in use and a second position in which the bridge means affords access for personnel from said building into said vessel, drive means for said lift means, mounted upon said building, whereby said lift means may be operated to

retract said cables and thereby raise said vessel from a lower position to a higher position, and brake means, operable from



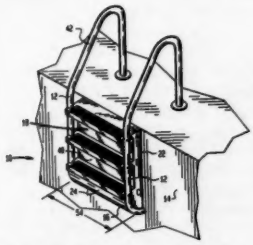
within said vessel, to control lowering of said vessel by gravity from a higher position to a lower position.

5,065,840

SWIMMING POOL SAFETY LADDER

Lloyd Cadigan, 30 Witches Hollow Rd., Millstone, N.J. 08535

Filed Nov. 5, 1990, Ser. No. 609,445
Int. Cl.[5] E06C *9/00*
U.S. Cl. 182—93 **7 Claims**



1. A safety ladder for a side wall of a swimming pool comprising:

a pair of handrails;

a plurality of vertically disposed steps secured to, and extending between, said handrails, each including a pair of opposing side edges and a back edge;

with said plurality of steps being fabricated of a construction joining together said back edges of adjacent steps of said plurality and also joining together corresponding side edges of adjacent steps of said plurality, thereby forming a unitized enclosure;

and with said construction joining together said back edges of said steps substantially flush with said swimming pool side wall; and

wherein said handrails include a curvilinear section at one end thereof curving inwardly of said pool and towards said side wall, and wherein one step of said plurality incorporates an underside surface of corresponding curvilinearity, extending to contact said swimming pool side wall.

5,065,841

LUBRICATING SYSTEM FOR A VERTICAL SHAFT ENGINE

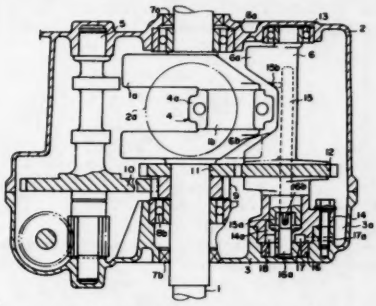
Katsumi Takagaki, Urawa, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 577,252
Claims priority, application Japan, Sep. 27, 1989, 1-113945[U]
Int. Cl.[5] F01M *1/04*
U.S. Cl. 184—6.18 **6 Claims**

1. In a lubricating system for a vertical shaft engine having a crankcase housing a camshaft and storing lubricating oil, a vertical crankshaft rotatably mounted in the crankcase and comprising a crankpin and a pair of crank webs, a connecting rod jounaled by said crankpin at a big end of the connecting rod, a balancer shaft parallel to said vertical crankshaft and rotatably mounted in said crankcase at a side of said crankshaft opposite from said camshaft, a counterweight on said balancer shaft for counterbalancing the mass of said crank webs, an oil pump coaxially mounted under said balancer shaft in said crankcase, so as to be driven by the balancer shaft the improvement of said system which comprises:

an oil passage vertically formed in a center portion of said balancer shaft between said pump and an upper portion of said counterweight and communicating with said pump;

an ejecting port substantially horizontally formed in said counterweight and perpendicularly communicating with said oil passage for supplying the lubricating oil to said big end of the connecting rod;



said counterweight having a recessed portion at a center portion thereof in which recessed portion the crankpin is expendable such that said being end of the connecting rod avoids interfering with said counterweight when said crankshaft rotates; and

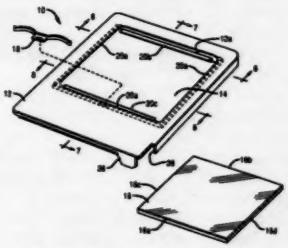
said ejecting port being disposed at an upper portion of said recessed portion adjacent an upper portion of the crankpin for closely approaching an upper side of said big end and being synchronized by timing both rotation of said crankshaft and of said balancer shaft so as to cause said ejecting port to substantially coincide with said upper side of said big end, whereby said big end is properly lubricated with a simple structure.

5,065,842

REMOVABLE WINDOW CARRIER FOR MOUNTING IN A SCANNER CHECKOUT COUNTER

Rathindra Nahar, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 18, 1989, Ser. No. 395,624
Int. Cl.[5] A47F *9/04*
U.S. Cl. 186—61 **4 Claims**



1. A removable window carrier for mounting in a scanner checkout counter having a top surface;

said removable window carrier comprising:

a frame member having an aperture therein;

a window member; and

securing means located on said frame member and associated with said aperture for removably securing said window member in said aperture;

whereby when said removable window carrier is mounted in the scanner checkout counter said window member provides a transparent support through which scanning light beams are projected and over which items of merchandise bearing coded labels are passed;

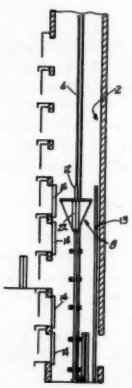
said frame member including first and second walls which are generally opposed to third and fourth walls, respectively, to define said aperture; said securing means including a top flange located only on said first, second, and fourth walls and further including first and second bottom flanges which are located only on said first and third walls, respectively, whereby said top flange and said first and second bottom flanges cooperate to secure the window member in said aperture.

5,065,843

METHOD FOR INSTALLING ELEVATOR SYSTEM COMPONENTS

Douglas Richards, Crayford, England, assignor to Otis Elevator Company, Farmington, Conn.

Filed May 16, 1990, Ser. No. 523,941
Int. Cl.[5] B66B *9/18*
U.S. Cl. 187—1 R **1 Claim**



1. A method for installing elevator system components in an elevator hoistway in a building under construction, said method comprising;

(a) positioning a construction elevator in said hoistway along with the elevator system components;

(b) hoisting said construction elevator in the hoistway;

(c) positioning a working platform over a top of the hoistway to cover the hoistway;

(d) plumbing lines of installation for each elevator system component in the hoistway from the working platform when the latter is positioned at the top of the hoistway;

(e) winching the elevator system components upward in the hoistway from the working platform while the latter is positioned at the top of the hoistway along the plumb lines to the construction elevator; and

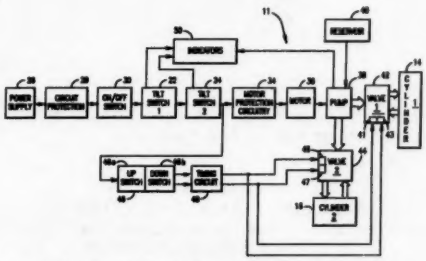
(f) securing the elevator system components along the plumb lines from the construction elevator.

5,065,844

HYDRAULIC PLATFORM AND LEVEL CORRECTING CONTROL SYSTEM

Clarence C. Hon, Cherry Hill, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 3, 1989, Ser. No. 431,110
Int. Cl.[5] B66B *11/04*
U.S. Cl. 187—17 **23 Claims**



1. A hydraulic lifting platform utilizing an electrohydraulic control system comprising

a pair of double acting hydraulic actuating means for providing the lifting force for said platform,

control circuit means for driving said hydraulic actuation means,

at least one angular position detection switch, said control circuit means being responsive to said switch, said switch comprising an electrically conductive liquid switch for determining if said platform is tilting in any direction during normal operation and to terminate power to said control circuit means if said platform is tilting whereby platform operation is suspended, and

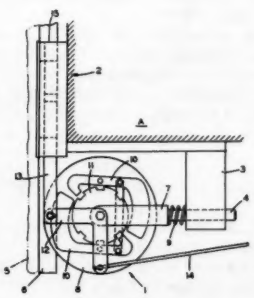
a servomechanism which is responsive to said angular position detection switch for adjusting the level of the platform when a tilt is detected in the platform during normal operation and resuming the normal operation when the platform is level.

5,065,845

SPEED GOVERNOR SAFETY DEVICE FOR STOPPING AN ELEVATOR CAR

David B. Pearson, 796 Lynwood St., Raitan, N.J. 08869

Filed Sep. 13, 1990, Ser. No. 582,428
Int. Cl.[5] B66B *5/22*
U.S. Cl. 187—89 **20 Claims**



1. An apparatus for stopping an elevator car comprising: a safety device for engaging an elevator guide rail to stop an elevator car; and a speed governor having a running wheel rotatably mounted on an axle attached to a U-shaped frame, said wheel being biased against and driven by the guide rail for

the elevator car in an elevator shaft and said U-shaped frame being attached to an axially slidable shaft, said slidable shaft being guided by a bracket adapted to be attached to the elevator car, a ratchet wheel fixedly attached to said axle, at least one pair of centrifugal force operated release levers attached to said running wheel which during normal operation of the elevator car rotate around said ratchet wheel, an actuating lever attached to said axle, and a release arm connected between said actuating lever and said safety device whereby upon the occurrence of an overspeed condition of the car in either direction of travel of the car, said release levers engage said ratchet wheel causing said ratchet wheel to rotate in a direction corresponding to the direction of travel of the car, said ratchet wheel further causing said actuating lever to be rotated in a direction corresponding to the direction of travel of the car to move said release arm in a direction associated with the direction of travel of the car and actuate said safety device.

5,065,846

ELEVATOR GROUP CONTROL FOR THE IMMEDIATE ASSIGNMENT OF DESTINATION CALLS

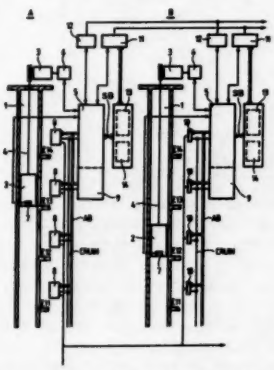
Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Switzerland

Filed Jan. 12, 1990, Ser. No. 464,524

Claims priority, application Switzerland, Jan. 19, 1989, 169/89-9

Int. Cl.[5] B66B *1/18*

U.S. Cl. 187—127 **8 Claims**



1. In a group control for elevators having at least two elevator cars for serving a plurality of floors and for the immediate assignment of floor calls of destination including call registering devices located at the floors for entering calls for desired floors of destination, a call memory for each elevator of the group connected with the call registering devices, wherein on the input of call at a floor, a call identifying the input floor and a call identifying the destination floor are stored in the call memories, load measuring devices provided in the cars of the elevator group and connected with a load memory in which load values corresponding to the persons present in the car at a future stop are stored, a selector associated with each elevator of the group and indicating the floor of a possible stop, and means for assigning the entered calls to the cars of the elevator group immediately after the calls are entered having for each car a computer and a comparison device, the computer calculating operating costs corresponding to the waiting times of passengers from data specific to the associated elevator, the comparator comparing the operating costs of all of the elevators one with the other, and the computer assigning the call concerned to that car which displays the lowest operating costs through entry of an assignment instruction into an associated assignment memory, the improvement comprising:

the call memory for each elevator car including a first register for storing calls of like direction of travel entered ahead of the car, a second register for storing calls of opposite direction of travel and a third register for storing calls of like direction of travel entered behind the car, and the selector being connected only with said first register and the associated assignment memory;

the load memory for each elevator car including at least two columns of memory cells wherein the load values resulting from the calls entered ahead of the car in the like direction of travel are stored in the memory cells of one of said columns and the load values v resulting from the calls entered behind the car in the like direction of travel are stored in the memory cells of the other column; and

a control circuit for each elevator car connected with the call memory and the load memory associated with the car and activated by each entry of a call such that a call in the same direction of travel as the car is according to its position with respect to the car written into one of said first and third registers and access to the associated one of said columns is enabled, said control circuit transferring the calls of said third register into said second register on a first change in direction of travel of the car and into said first register on a second change in direction of travel of the car.

5,065,847

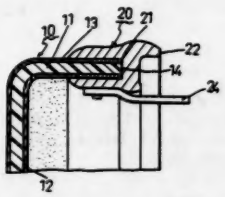
BRIEFCASE FORMED WITH THERMOFORMED LAMINATE SHELLS

Dick M. Hsieh, No. 18, Lane 777, Chung Shan Rd., Kuei Jen Hsiang, Tainan Hsien, Taiwan

Continuation of Ser. No. 514,873, Apr. 26, 1990, abandoned. This application Mar. 28, 1991, Ser. No. 676,746

Int. Cl.[5] A45C *3/00, 13/00, 5/02*

U.S. Cl. 190—125 **2 Claims**



1. A briefcase, comprising two pan shaped casing halves each having a face panel and a peripheral flange, said casing halves being hinged to one another to allow movement between a closed position and an open position, a first and a second briefcase frame respectively attached to each of said casing halves, a handle piece attached to one of said briefcase frames, a lock incorporated in said briefcase frames, said improvement comprising:

each of said casing halves including a pan shaped thermoformed laminate which includes an inner layer of lining fabric, a center layer of plastic EVA foam, and an outer layer of strong fabric cloth, said center layer extending into both said face panel and said peripheral flange and having a thickness sufficient to provide elastic properties and tensile strength to maintain the shape of said casing half.

5,065,848

BRAKE-DISC-ROTOR ATTACHER IMPELLER (INTERSECTING/LOCKER)

David M. Barrett, P.O. Box 1693, Oklahoma City, Okla. 73101

Filed Nov. 27, 1989, Ser. No. 441,633

Int. Cl.[5] B60K *41/20*

U.S. Cl. 192—1.36 **16 Claims**

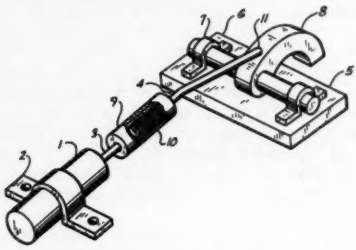
1. A device for securing a wheeled vehicle which is equipped with disk brakes and disk brake rotors by securing

one or more of the disk brake rotors against movement, and for providing enhanced benefits of security to the vehicle and convenience to an owner of the vehicle, said device comprising:

one or more pawls capable of being inserted into heat-sink recesses of said one or more disk brake rotors;

deploying means for deploying said one or more pawls into a deployed position intersecting one or more of the heat-sink recesses of said one or more disk brake rotors;

controlling means for controlling selective positioning of said one or more pawls in the intersection of, or removal



from, said heat sink recesses of said one or more disk brake rotors;

mounting means for mounting the device in the appropriate position with respect to one or more said disk brakes;

whereby the vehicle securing device does not interfere with the operation of the vehicle by a legitimate operation and functions without requiring action on the part of a legitimate operator to secure the vehicle from being moved by securing the position of one or more ground contacting tires through said one or more pawls intersecting said one or more heat-sink recesses and thus locking said one or more disk brakes.

5,065,849

METHOD FOR CORRECTING DATA USED FOR A CLUTCH CONTROL OPERATION

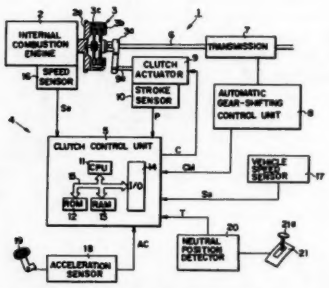
Hiromi Kono, and Masuhiro Ohtsuka, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1990, Ser. No. 503,975

Claims priority, application Japan, Apr. 12, 1989, 1-90772

Int. Cl.[5] B60K *41/28*

U.S. Cl. 192—0.076 **8 Claims**



1. A method for correcting clutch data relating to a friction type clutch connected with an internal combustion engine for carrying out an engaging operation for driving off a vehicle with a transmission system, the clutch data including meet position data representing a meet position of the clutch, said method comprising the steps of:

updating the meet position data by a predetermined learning operation each time a member for selecting an operation mode of the transmission system is set to a prescribed selected state;

detecting an operation condition of the internal combustion engine on the basis of a rotational speed of the engine during the engaging operation of the clutch each time the engaging operation of the clutch for driving the vehicle off is carried out; and

correcting the meet position data obtained in said updating step in accordance with the detected operation condition obtained in said detecting step.

5,065,850

ACTUATOR FOR A SERVO CONTROLLED CLUTCH WITH LUBRICATING MECHANISM

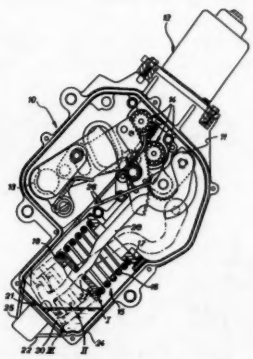
Patrice Bertin, Mery-sur-Oise, and Christian Pankowiak, Saint-Ouen, both of France, assignors to Valeo, Paris, France

Filed Apr. 10, 1990, Ser. No. 506,813

Claims priority, application France, Apr. 13, 1989, 89 04889

Int. Cl.[5] F16D *23/12*

U.S. Cl. 192—90 **8 Claims**



1. An actuator for a servo controlled clutch, comprising: a casing; a motor carried by the casing; and output member carried by the casing for actuating the clutch; a mechanism in the casing, coupling the motor with the output member for controlling the latter under the control of the former, the casing being liquid-tight for containing a reserve of liquid lubricant and including a lower portion; pumping means carried by the casing adjacent to said lower portion of the casing, the pumping means having a suction port and at least one delivery port; means connecting the suction port into the casing; and further means connecting the or each delivery port with said mechanism in at least one region thereof, said mechanism including a moveable thrust unit and the actuator further including means mounting the thrust unit in the casing for reciprocating movement into and out of engagement with the pumping means, whereby to actuate the latter to convey lubricant from said reserve thereof to said region or regions of the mechanism.

5,065,851

CLUTCH CONTROL UNIT

Masuhiro Otsuka, and Hiromi Kono, both of Saitama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Jul. 23, 1990, Ser. No. 556,381

Claims priority, application Japan, Jul. 24, 1989, 1-190877

Int. Cl.[5] F16D *43/00*

U.S. Cl. 192—103 R **2 Claims**

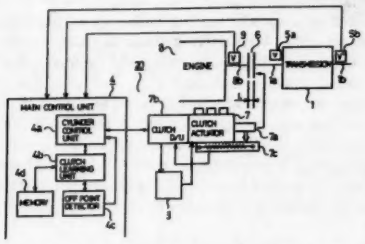
1. A clutch control system comprising:

a clutch;

a clutch control unit for controlling said clutch;

a sensor for detecting the number of revolutions of an output shaft of said clutch;

a clutch learning unit for determining a clutch position at which said number of revolutions is equal to a predetermined value by moving said clutch toward connection from a predetermined learning starting point and controlling said clutch control unit based on said clutch position thus determined;



a clutch off point detector for determining, if said number of revolutions is not zero when said clutch is at said learning starting point, a clutch off point at which said number of revolutions is zero by moving said clutch toward disconnection until said number of revolutions becomes zero; and

said clutch learning unit starting a learning activity by taking said clutch off point as a new learning starting point.

5,065,852

MACHINE FOR AUTOMATICALLY POSITIONING AND FEEDING CONTAINERS

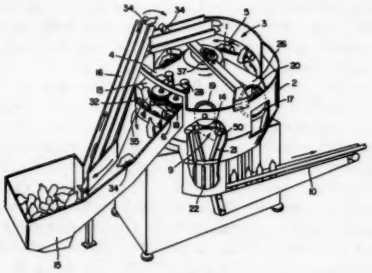
Jaime S. Marti, c/Emancipación 8, 08017-Barcelona, Spain

Filed Dec. 7, 1990, Ser. No. 623,558

Claims priority, application France, Dec. 8, 1989, 89 16675; Jun. 1, 1990, 90 07301

Int. Cl.[5] B65G *29/00*

U.S. Cl. 198—392 **20 Claims**



1. Machine for automatically orienting containers, such as plastic bottles, comprising:

a main hopper for receiving a plurality of randomly positioned containers;

a side wall on said main hopper;

a bottom in said main hopper having a peripheral portion spaced from said side wall to provide a space through which containers on said bottom can pass;

container holder support means having a peripheral portion and supported below said hopper for movement of said peripheral portion thereof in a path adjacent said peripheral portion of said bottom;

means for driving said container holder support means in said path;

container holder means mounted on said container holder support means for movement therewith and forming recesses for receiving and holding the containers in a lying position from said peripheral portion of said bottom;

discharge openings in said container holder means for allowing the containers to pass therethrough;

container support shelf means extending below said holders for supporting the containers in a lying position in said receiving recesses during movement of said container holder means;

a discharge section in said support shelf means for discontinuing support of the containers at a predetermined location so that containers in said container holder means pass through said openings at said discharge section;

tilting means on said container holder means engaging one part of each container for tilting the container into a predetermined position as the container passes through said openings at said discharge section;

chute means mounted below and movable with said discharge openings for receiving, orientating and guiding containers passing through said discharge openings into a predetermined position, each chute means having a lower exit portion;

a lateral aperture in said side wall container holder means in a curved area preceding said discharge section and adapted for ejection therethrough by centrifugal force containers incorrectly positioned on said container holder means;

an external recovering hopper in communication with said lateral aperture for receiving containers ejected through said lateral aperture; and

conveyor means on said external recovering hopper for recycling containers therein by transferring containers from said recovering hopper into the loading area of said main hopper.

5,065,853

LOCKUP CLUTCH OF TORQUE CONVERTER

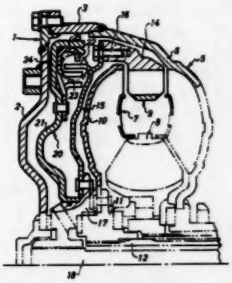
Shinji Fujimoto, and Mitsugu Yamaguchi, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Continuation of Ser. No. 393,917, Aug. 4, 1989. This application Jan. 23, 1991, Ser. No. 644,862

Claims priority, application Japan, Dec. 28, 1987, 62-336326

Int. Cl.[5] F16D *33/00*

U.S. Cl. 192—3.29 **2 Claims**



1. A lockup clutch torque converter comprising a front cover as an input part, an impeller linked to an outer circumference of said front cover, a second turbine disposed between said front cover and impeller in a position opposite to said impeller in an axial direction of said torque converter, a first turbine disposed between said impeller and the outer circumference of said second turbine, a stator disposed between said impeller and an inner circumference of said second turbine, a second turbine output part to which the inner circumference of said second turbine is linked, a first turbine power take-off support stretching outside said second turbine in a radial direction of said torque converter and between said second turbine and said front cover, a first turbine output part to which the inner circumference of said support is linked, and a clutch disc slidably mounted on said first turbine output part and disposed

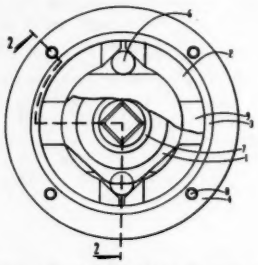
between said support and said front cover, said clutch disc including a piston, a friction facing for linking said clutch disc to an inside of said front cover by friction and an output part on said support, said clutch disc including damper springs for linking said clutch and said output part on said support when said clutch is linked by friction to said front cover.

5,065,854

SECURITY AND REGULATION MECHANISM TO BE USED AS INSTANTANEOUS ANTIRETURN SYSTEM IN BOTH ROTATIONAL TURNS LEVOTURN AND DEXTROTUR

Martin S. Serrano, and Antonio H. Sanz, both of c/Foresth, 4, Tres Cantop, Madrid, Spain

Filed Jan. 30, 1990, Ser. No. 472,667
Claims priority, application Spain, Feb. 1, 1989, 8.900.345
Int. Cl.[5] F16D *67/00*
U.S. Cl. 192—8 R **7 Claims**



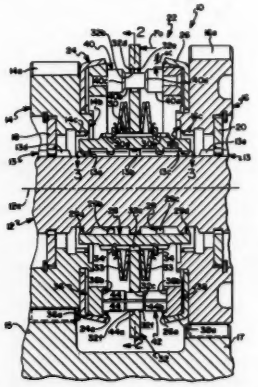
1. Regulatory and safety device to be used as an instantaneous anti-return system in both rotational directions, right and left, comprising: a cylindrical casing having a peripheral braking surface an input driving shaft extending through the casing, a plurality of annular brake-shoes mounted within the casing, a rolling track adjoining the casing upon which the brake-shoes are guided, an output driving shaft mounted on said input driving shaft, and the input shaft supporting the brake-shoes.

5,065,855

SELF-ENERGIZING SPLINES FOR A SYNCHRONIZER

Richard A. Nellums, Chorley, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 24, 1990, Ser. No. 632,882
Int. Cl.[5] F16D *23/06*
U.S. Cl. 192—53 E **10 Claims**



1. A pin-type synchronizer mechanism for first and second axially spaced apart gears mounted for rotation and secured against axial movement on shaft means having an axis about which the gears and the shaft means rotate, the mechanism comprising:

gear friction and jaw means affixed to each gear, the friction means engagable with first and second axially spaced apart and axially movable friction means for respectively synchronizing the first and second gears with the shaft, the jaw means engagable with axially movable jaw means defined by a clutch member including axially extending internal spline teeth having flank surfaces disposed for mating relation with flank surfaces of external spline teeth affixed to the shaft means;

a flange extending radially between the first and second friction means for axially moving the axially movable friction and jaw means from a neutral position into said engagement in response to an axially bi-directional shift force (F_o) applied to the flange means securing the flange against rotational movement relative to the clutch member;

blocker means operative when engaged for preventing engagement of the jaw means prior to the synchronizing, the blocker means including a plurality of circumferentially spaced pins rigidly extending axially from the first and second friction means and into openings of the flange, each of the pins having axially spaced apart blocker shoulders engagable with blocker shoulders defined on opposite sides of the flange and about the associated opening;

pre-energizer means for engaging either one of the first and second friction means in response to initial axial movement of the flange by the shift force (F_o) from the neutral position toward one of the gears for engaging the blocker means in response to engagement of the friction means producing a synchronizing torque transmitted to the flange via the pins and for transmitting the shift force (F_o) to the engaged friction means via the engaged blocker means to increase the engaging force of the engaged friction means; characterized by:

the external spline teeth defined by at least first, second, third, and fourth axially spaced apart spline teeth portions, the first and second portions axially disposed between the third and fourth portions and having axially facing ends defining at least one self-energizing ramp surfaces;

the internal spline teeth defined by at least fifth and sixth axially spaced apart spline teeth portions having axially oppositely facing ends defining at least one self-energizing ramp surface, flank surfaces of the first and second portions respectively mating with flank surfaces of the fifth and sixth portions during the neutral position of the jaw member, the flank surfaces of the fifth and sixth portions, respectively mating with flank surfaces of the third and fourth portions during the engaged position of the clutch member jaw means respectively with the first and second gear jaw means, the ramp surfaces of the second and sixth portions engaged in response to synchronizing torque in one direction from the first friction means for producing an axial additive force (F_a) on the flange in the direction of the first friction means, and the ramp surface of the first and fifth portions engaged in response to synchronizing torque in one direction from the second friction means for producing an axial additive force on the flange in the direction of the second friction means.

5,065,856

APPARATUS AND METHOD FOR PACKAGING ARTICLES

Laurie M. Reid; Archie Koster, both of Casselberry, and Gary D. Hunt, Longwood, all of Fla., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Jun. 12, 1989, Ser. No. 365,207
Int. Cl.[5] B65G *47/26*
U.S. Cl. 198—419.3 **24 Claims**

1. A method for generating at least one discrete group of

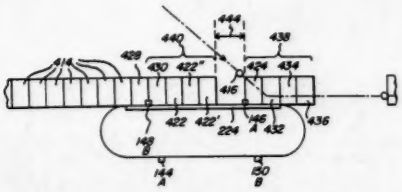
articles from at least one row of articles being conveyed in single file along a conveyor path in a direction from an upstream towards a more downstream position, said method comprising the steps of:

(a) pushing a leading portion of said row onto a stationary section of said conveyor path;

(b) accelerating said leading portion further across said stationary section relative to a remaining portion of said row to generate a gap between said leading and remaining portions and thereby form a discrete group from said leading portion, said accelerating step comprising

i) inserting at least two projecting means into said leading portion between adjacent articles on said stationary section, one said projecting means being leading and the other said projecting means being trailing, the leading projecting means being inserted between adjacent articles at a point downstream from said trailing projecting means by a distance defining a predetermined number of articles in said group to be generated, whereby a defined number of articles comprising said group to be generated is disposed between the leading and trailing projecting means, and

ii) accelerating said leading projecting means relative to said trailing projecting means to propel any articles downstream of said leading projecting means over said stationary section further along said conveyor path in a downstream direction, while the remainder of articles in said row upstream of said trailing projecting means and said defined group of articles immediately downstream of said trailing projecting means is not subjected to such acceleration;



(c) after said accelerating step, inserting an additional projecting means into remaining articles of said leading portion at a point upstream of said trailing projecting means, said additional projecting means being separated from said trailing projecting means by said distance;

(d) also after said acceleration step, withdrawing said leading projecting means from said row, whereby said trailing projecting means becomes a successive leading projecting means and said additional projecting means becomes a successive trailing projective means with a successive defined discrete group of articles therebetween;

(e) accelerating said successive leading projecting means relative to said successive trailing projecting means to propel said defined discrete group over said stationary section further along in said downstream direction to separate said successive defined discrete group from said remainder of articles in said row in accordance with paragraph ii) of step (b); and

(f) repeating paragraph ii) of step (b) and steps (c), (d) and (e) by continuing to insert successive additional projecting means and accelerating each successive defined discrete group in turn downstream of each successive leading projecting means over said stationary section to continuously separate discrete groups from said row, and

wherein said articles are being pushed onto said stationary portion in a downstream direction at a predetermined conveyor speed SM, and each said successive trailing projecting means is moved in said downstream direction at a speed SG1 substantially equal to said speed SM, and each successive trailing projecting means after moving at speed SG1 becomes a successive leading projecting means and is accelerated to a speed SG2 to separate the successive defined discrete group downstream thereof from said row, SG2 being greater than SG1, and

wherein after each successive leading projecting means is accelerated to speed SG2 to separate each successive group, such speed SG2 is maintained along said stationary section to provide a gap of preselected length between each group, and

wherein each successive group is propelled downstream by its corresponding successive leading projecting means until said corresponding successive leading projecting means is withdrawn from said row, and said group is conveyed further downstream by additional conveying means after said corresponding successive leading projecting means is withdrawn, and

wherein each successive leading projecting means is decelerated to a speed SG3 less than SG2 before being withdrawn from said row to permit a relatively smooth transition for said corresponding group from being propelled by said successive leading projecting means to being conveyed further along said conveyor direction by said additional conveying means.

5,065,857

METHOD IN HANDLING OF RETURNABLE BOTTLES AND DEVICE FOR HANDLING OF RETURNABLE BOTTLES

Raimo Lehtola, Kouvola, Finland, assignor to Halton OY, Finland

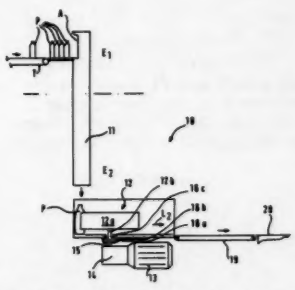
PCT No. PCT/FI89/00210, § 371 Date Jul. 18, 1990, § 102(e) Date Jul. 18, 1990, PCT Pub. No. WO90/06274, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 15, 1989, Ser. No. 543,774

Claims priority, application Finland, Dec. 2, 1988, 885637

Int. Cl.[5] B65G *47/04*

U.S. Cl. 198—457 **6 Claims**



1. A method for handling returnable bottles from an upper shop space into a lower storage space comprising

arranging a dropping tube vertically such that an upper end of the tube is adjacent to an upper shop space and a lower end of the tube communicates with a lower drop space,

feeding a plurality of returnable bottles into said upper shop space such that the bottles are fed into the tube freely fall by the force of gravity through the tube to said lower drop space,

providing said lower drop space with a rotatable transfer brush having a plurality of bristles such that each bottle falls into a space between said bristles,

rotating said brush such that after each bottle lands between said bristles in said lower drop space, said bottle is displaced from a location under said tube, such that the next bottle may fall freely into a space between said bristles under said tube, and

guiding each bottle out of said lower drop space and into a new storage area via a curved guide part which guides the bottles onto a conveyor.

5,065,858

GAS-FED TRANSFER TRACK

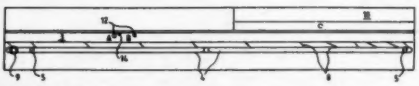
Nigel J. Akam, Largs; Donald M. Cameron, Gourock; David K. Halliday, Greenock, and Raymond Paterson, Kirktonhill, all of Scotland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1990, Ser. No. 481,019

Claims priority, application United Kingdom, Feb. 16, 1989, 8903562.0

Int. Cl.[5] B65G *47/22*

U.S. Cl. 198—493 9 Claims



1. A gas feed transfer track for transferring articles from a first to a second location comprising:

a channel-shaped section along which said articles travel;

means for supplying a gas flow along the surface of said channel-shaped section in such a direction as to propel articles from the first to the second location; and

characterized by at least two gas outlet slots positioned to interact in said channel-shaped section for generating turbulence at least at said first location to cause suspension of said articles;

means for controlling the number of articles supplied to said second location at any one time, said means for controlling comprising two stop pins situated in the vicinity of the second location, the movement of which are synchronized such that when one protrudes from the surface of said channel, the other is retracted, and

detection means for sensing the presence of an article at the stop pin nearer said second location to cause said nearer pin to retract and said pin farther from said second location to protrude.

5,065,859

CONVEYOR BELT SCRAPER

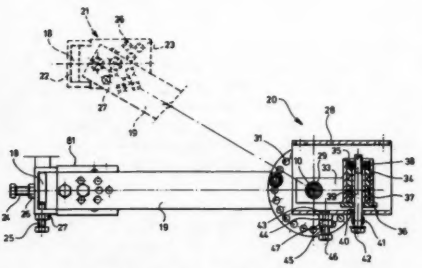
John A. Brumby, St. Austell, England, assignor to Ace Conveyor Equipment Limited, Nr Doncaster, England

Filed Apr. 18, 1990, Ser. No. 510,865

Claims priority, application United Kingdom, Apr. 28, 1989, 8909840

Int. Cl.[5] B65G *45/00*

U.S. Cl. 198—499 12 Claims



1. In a conveyor belt scraper of the type comprising:

at least one arm adapted to be pivotally mounted by a pivotal connection to a fixed structure adjacent a movable conveyor belt;

a scraper blade secured to a free end of said arm for contact with the belt in use of the scraper; and

resilient biasing means for urging said arm to turn about its pivotal connection to said fixed structure whereby to press said scraper blade into contact with said belt, the improvement comprising:

said resilient biasing means comprising a stack of resiliently compressible elements stressed in compression when said arm is turned in one direction about said pivotal connection;

a stack casing, said resiliently compressible elements being held in a stack by said stack casing;

a secondary arm of said scraper;

means securing said stack casing holding said compressible elements of said resilient biasing means to said secondary arm of said scraper, and

a housing, said secondary arm and said stack casing being located within said housing, and said housing pivotally mounting said at least one arm to said fixed structure adjacent said movable conveyor belt.

5,065,860

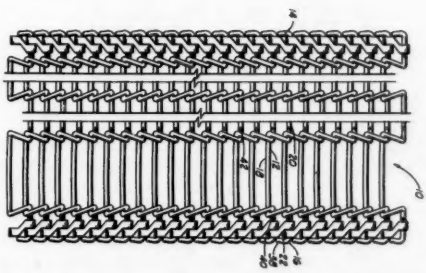
CONNECTORS FOR WOVEN CONVEYOR BELTS

William G. Faulkner, 6701 Newman Dr., Oklahoma City, Okla. 73162

Filed Apr. 12, 1990, Ser. No. 508,870

Int. Cl.[5] B65G *15/54*

U.S. Cl. 198—848 2 Claims



1. An improvement in a woven conveyor belt comprising a plurality of links with each link having opposite ends and a plurality of forward extending clips and a plurality of rearward extending clips wherein each of the forward extending clips on each of the links is clippably connectable to one of the forward extending clips on an adjacent link and wherein each of the rearward extending clips on each of the links is clippably connectable to one of the rearward extending clips on an adjacent link assembly, for connecting the links to form the woven conveyor belt, the improvement comprising:

each link being constructed of a plastic;

a plurality of connectors, each connector having one portion connected to one of the links and another portion connected to an adjacent link whereby the connectors cooperate to substantially prevent the rearward extending clips and the forward extending clips from becoming unclipped during the operation of the woven conveyor belt; and

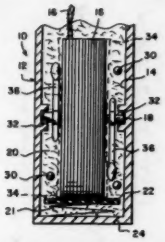
a pair of posts disposed on each rearward extending clip with each post being disposed near an adjacent rearward clip whereby the posts cooperate with the rearward extending clips for preventing the rearward extending clips from becoming unclipped during the operation of the woven conveyor belt.

5,065,861

TREATED DENTAL FLOSS AND DISPENSER

Michael D. Greene, 100 Woodsville Rd., Hopewell, N.J. 08525, and George Spector, 233 Broadway Rm 3815, New York, N.Y. 10007

Filed Sep. 14, 1990, Ser. No. 582,407
Int. Cl.[5] A61B *19/02*; A61C *15/00*
U.S. Cl. 206—63.5 4 Claims



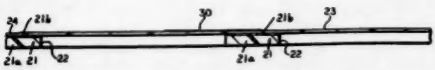
1. An improved dental floss dispenser comprising:
a) a container having a chamber therein;
b) a roll of waxed dental floss having a shaft that is rotatably supported in the chamber of said container;
c) a quantity of powdered baking soda carried in the chamber of said container;
d) means in the bottom of the chamber of said container for roughening said dental floss when said dental floss is being pulled out of said container;
e) means in the chamber of said container for agitating said baking soda while said roughened dental floss is being pulled out of said container so that said baking soda can adhere to said roughened dental floss; and
f) a cutter on said container for removing a piece of the roughened dental floss with particles of said baking soda adhered thereupon so it can be utilized in conjunction with hydrogen peroxide when used in areas between the teeth for the treatment of gingivitis.

5,065,862

PLASTIC CAN CARRIER AND METHOD OF MAKING

Carlton R. Mousseau, Sylvania; Louis M. DiBello, Perrysburg, and Nicholas J. Nicholas, Toledo, all of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jun. 21, 1990, Ser. No. 541,644
Int. Cl.[5] B65D *71/00*; B29F *3/00*
U.S. Cl. 206—151 15 Claims



1. The method of making a carrier for a container package for cans having a top, a peripheral bead, a side wall and an inclined portion extending upwardly and inwardly toward the bead, said method comprising
coextruding a web of coextruded plastic comprising a first layer and a second layer, said second layer having a melting point less than that of said first layer,
forming said web into a plurality of interconnected sheet portions of flexible plastic material, each sheet portion having a plurality of openings for receiving the upper ends of the cans, and
successively heat bonding at least one film of plastic material at the isolated areas to the upper surfaces of each sheet portion of said to form a continuous laminated web of carriers of film and sheet portions,
said second layer of the coextruded plastic web having a melting point less than that of said film.

9. A carrier for a container package holding an array of cans, each of which has an annular bead on the upper end thereof comprising
a sheet of flexible plastic material having a plurality of openings forming an array for receiving the ends of the cans and at least one film of plastic material coextensive with said sheet and bonded to isolated portions of said sheet,
said sheet being made as a coextruded sheet comprising a first layer and second layer,
said second layer having a melting point lower than that of said first layer or said film thereby facilitating the bonding of the film to the sheet by heat.

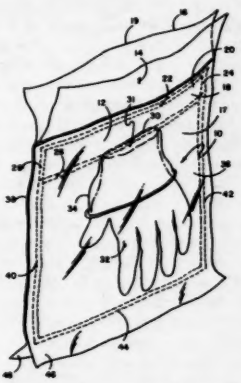
12. A container package comprising
an array of cans, each of which has an annular bead on the upper end thereof comprising
a sheet of flexible plastic material having a plurality of openings forming an array receiving the ends of the cans and at least one film of plastic material coextensive with said sheet and bonded to isolated portions of said sheet,
said sheet being made as a coextruded sheet comprising a first layer and second layer,
said second layer having a melting point lower than that of said first layer or said film thereby facilitating the bonding of the film to the sheet by heat.

5,065,863

STERILE GLOVE PACKAGING AND METHOD OF PREVENTING CONTAMINATION FROM SPREADING FROM ONE ENVIROMENT TO ANOTHER

Francisco Moyet-Ortiz, Valle Tolimas, Calle 11 N-17, Caquas, P.R. 00625

Filed Oct. 9, 1990, Ser. No. 594,694
Int. Cl.[5] B65D *85/18*
U.S. Cl. 206—210 3 Claims



1. A combination glove and packaging comprising;
a glove member having a wrist area, a body area, fingers and a sleeve, said sleeve folded forward over the body of said glove member, said glove member with said sleeve folded forward having a top and a bottom;
a front cover member having a top and a bottom, said front cover member disposed over the top of said glove member;
a rear cover member having a top and a bottom, said rear cover member disposed at the bottom of said glove member;
a releasable upper glove compartment seal extending near the top of and between said front cover member and said rear cover member from said wrist area of said glove member, said upper glove compartment seal extending to join said front cover member to said rear cover member, said upper glove compartment seal dividing said front and rear cover members into an upper entry compartment

having left front and rear sides and right front and rear sides and a lower glove compartment having a top and a bottom and left and right sides;

a left seal attaching the left front side of said upper entry compartment to the left rear side of said upper entry compartment;

a right entry seal attaching the right front side of said upper entry compartment to the right rear side of said upper entry compartment; an upper entry compartment seal extending between said left entry seal and said right entry seal, said upper entry seal positioned to leave portions of said front cover member and rear cover member unattached to form a front entry tab and a rear entry tab respectively,

a lower glove compartment seal extending between said front cover member and said rear cover member near the bottom of said glove compartment beneath the fingers of said glove member;

a left glove compartment seal and right glove compartment seal extending respectively from the left and right sides of said lower glove compartment seal up to said upper glove compartment seal, hermetically sealing said glove compartment area with portions of said front cover member and rear cover member extending unattached below said lower glove compartment seal to form separate front glove compartment tab and rear glove compartment tab respectively, said seals being of the type which are separable by peeling; and

a glove attachment member extending around the perimeter of the interior of said sleeve of said glove member at its junction with said upper glove compartment seal, said glove attachment member possessing greater retentive properties than said upper glove compartment seal, such structure adapted to have said upper entry compartment seal and left and right entry seals first separated by pulling apart said front entry tab and rear entry tab along the upper entry seal and left and right entry seals down to said upper glove compartment seal to open said upper entry compartment for insertion of the user's hand through said upper entry compartment into said glove member and when desired, for said front glove compartment tab to be separated from said rear glove compartment tab to separate said lower glove compartment seal and left and right glove compartment seals to peel the front and rear covers back up to said upper glove compartment seal, exposing said glove member with the user's hand therein, said front and rear cover members to be further separated from said glove attachment member at said glove member by further pressure to expose said glove member for use in its sterile mode, such packaging further utilizable while said glove member is contained within said glove compartment for uses suitable therefor while still maintaining said glove member in a sterile condition.

5,065,864

LAUNDRY VALET

Wayne I. Schmitt, Coventry, R.I., assignor to American Tourister, Inc., Warren, R.I.

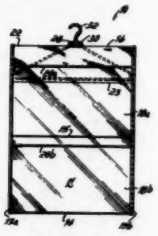
Filed Dec. 20, 1990, Ser. No. 630,831
Int. Cl.[5] A45C *3/00, 13/00*
U.S. Cl. 206—278 **4 Claims**

1. A laundry valet capable of hanging from a variety of available coat hangers comprising:

a pair of generally rectangular-shaped plastic panels, said panels having ends and sides and being secured together along said sides and one of the respective ends to define a first pocket therebetween, at least one of said panels having an opening communicating with and providing access to said first pocket, a zipper extending along said opening for opening and closing said first pocket, said panels being foldable permitting said valet to be conveniently packed,

a generally rectangular shaped fabric piece joined at one end of the valet to the other of the respective ends of said plastic panels, and

a triangular-shaped fabric panel joined to one side of said rectangular shaped fabric piece substantially but not entirely along two legs thereof, said triangular-shaped panel being unsecured to said valet along its base thereby defining a second pocket for removably receiving a coat



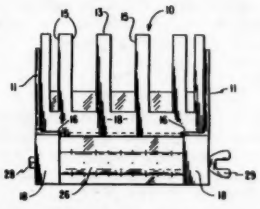
hanger therein, said second pocket being open at the bottom thereof along the unsecured leg of the triangular-shaped panel to receive said coat hanger therein and open at the top thereof permitting the hook portion of the coat hanger to protrude therefrom whereby said laundry valet may be suspended by said coat hanger removably received in said second pocket.

5,065,865

PRESSURE-REGULATED BANDAGE APPLICATOR

Daryl E. Doorenbos, R.R. 2, Box 85A, Le Mars, Iowa 51031

Filed Apr. 17, 1990, Ser. No. 516,070
Int. Cl.[5] B65D *85/67*
U.S. Cl. 206—409 **6 Claims**



1. A tension controlling bandage holder comprising a housing having a compartment adapted to hold a roll of bandage material, roller means to control tension on said material when said bandage material is pulled from said housing, said roller means including a drum having sides engaging said housing and axle means supporting said drum, said axle means being adapted to rotatably journal said drum in said housing, friction control means engaged between said housing and said axle means to create friction between said housing and said drum and to adjust the friction thus created, said bandage material engaging the exterior of said drum to cause said drum to rotate whereby the adjustment of friction between the drum and the housing provides for adjustment of the tension on said bandage material as it is removed from said housing.

5,065,866

STORAGE PHOSPHOR CASSETTE ASSEMBLY

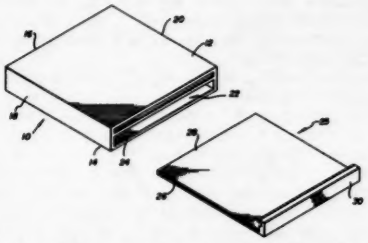
John C. Boutet, Rochester, N.Y., and Gary R. Unruh, Newark, Calif., assignors to Eastman Kodak Company, Rochester, N.Y. and Lumisys, Sunnyvale, Calif.

Filed Nov. 21, 1990, Ser. No. 617,121
Int. Cl.[5] G03B *42/04*
U.S. Cl. 206—455 **3 Claims**

1. A photo-stimulable storage phosphor cassette assembly comprising:

a generally rectangular cassette having spaced, elongated rectangular upper and lower walls and an end wall and spaced side walls joining said upper and lower walls; wherein said upper and lower walls, said end wall and said side walls enclose a five-sided cavity having an open end;

an elongated, rectangular rigid plate supporting a photostimulable storage phosphor layer, said plate having an upstanding rib;



said plate being dimensioned to be removably positioned in said cassette cavity so that said rib closes off said cassette open end; and

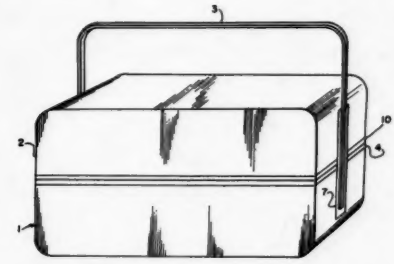
complementary light lock means on said plate rib and said cassette for preventing light from leaking into said cavity when said cassette and storage phosphor plate are assembled together.

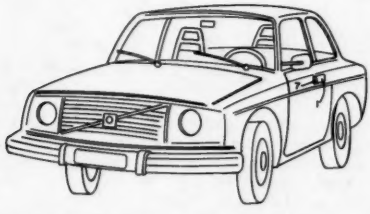
5,065,867

HOT AND COLD LUNCH BOX FOR AUTOMOBILE TRAVEL

Henry M. Alfredson, P.O. Box 84, St. James, N.Y. 11780

Filed Oct. 9, 1990, Ser. No. 600,404
Int. Cl.[5] B65D *25/28, 41/02*
U.S. Cl. 206—542 **3 Claims**





1. An insulated lunch box comprising

A pair of receptacles, each adapted to hold food, said receptacles comprising sections of said lunch box, each receptacle being made predominantly of high thermal barrier material, each receptacle having a mouth having a magnetic material at its periphery, whereby the magnetic material of both receptacles constitute means for attaching said receptacles to each other at the mouths of said receptacles, and whereby said magnetic material of each respective receptacle also constitutes means to attach said respective receptacle over the lock and handle on a vehicle, said receptacles each being adapted to placed over said vehicle lock and handle; and

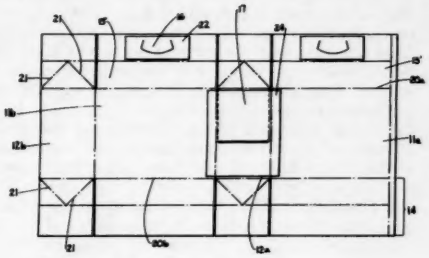
insulating means for closing each receptacle whereby food may be kept at different temperatures in the receptacles.

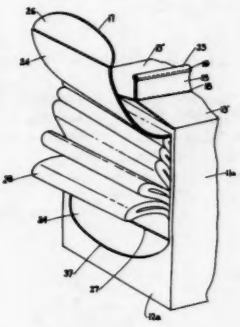
5,065,868

PACKAGE CONSISTING OF A PAPER BAG COMPACTLY PACKING COMPRESSED FLEXIBLE ARTICLES

Roger E. Cornelissen, c/o Grupo Arbora, Via Augusta 2 bis, 08006 Barcelona, Spain; Claus C. F. Haubach, and Agustin R. Blanco, both c/o Procter & Gamble GmbH, Sulzbacherstrasse 40, 6231 Schwalbach, Fed. Rep. of Germany

Filed Oct. 23, 1990, Ser. No. 602,445
Int. Cl.[5] B65D *85/16, 85/18*
U.S. Cl. 206—494 **19 Claims**





1. A substantially rectangular paper package containing compressed flexible articles, said paper package comprising:

(a) a front and a back panel connected to one another by means of a pair of side panels, a bottom panel and a top panel;

(b) an opening device comprising a pair of vertical lines of weakness located within one of said side panels of said paper package, said vertical lines of weakness defining a predetermined portion of said side panel to be at least partially separated from the remainder of said side panel without releasing the tension in the remainder of said side panel, said predetermined portion of said side panel being partially separated by applying a grasping force to a tear flap extending from the lowermost end of said opening device, whereupon said flexible articles coinciding with the aperture thus formed in said side panel expand through said aperture in a fan-like array while the portion of said flexible articles coinciding with the remaining tensioned portion of said side panel are retained in a substantially compressed condition; and

(c) an internal reinforcement sheet comprised of biodegrad-

able and/or recyclable material located on the innermost surface of said opening device and said tear flap and extending at least over the entire area of said opening device and beyond said vertical lines of weakness, said reinforcement sheet having a horizontal slit extending continuously between said vertical lines of weakness and substantially coinciding with the lowermost end of said opening device and the uppermost end of said tear flap.

10. A substantially rectangular paper package containing compressed flexible articles, said paper package comprising:

(a) a front and a back panel connected to one another by means of a pair of side panels, a bottom panel and a top panel;

(b) an opening device comprising a pair of vertical lines of weakness located within one of said side panels of said paper package, said vertical lines of weakness defining a predetermined portion of said side panel to be at least partially separated from the remainder of said side panel without releasing the tension in the remainder of said side panel, said predetermined portion of said side panel being partially separated by applying a grasping force to a tear flap extending from the lowermost end of said opening device, whereupon said flexible articles coinciding with the aperture thus formed in said side panel expand through said aperture in a fan-like array while the portion of said flexible articles coinciding with the remaining tensioned portion of said side panel are retained in a substantially compressed condition; and

(c) an internal reinforcement sheet comprised of biodegradable and/or recyclable material located on the innermost surface of said side panel comprising said opening device and said tear flap, said reinforcement sheet substantially coinciding with said tear flap having an uppermost end substantially coinciding with the lowermost end of said opening device and the uppermost end of said tear flap.

5,065,869

ELECTRONICALLY CONTROLLABLE VIBRATION DAMPING DEVICE

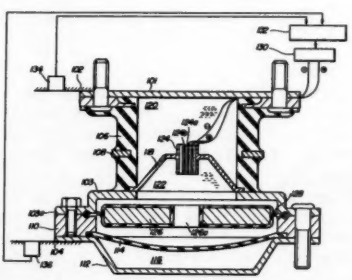
Kazuhiro Doi, Yokohama; Yasuhiko Fujiwara, Kanagawa; Toshiro Abe, Mitaka, and Shinichi Matsui, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 20, 1988, Ser. No. 221,570

Claims priority, application Japan, Jul. 20, 1987, 62-180728

Int. Cl.[5] F16F *9/00, 15/02*

U.S. Cl. 207—140.1 **12 Claims**



1. In a device which is interposed between a vibrating body and a base,

means defining a spring, said spring being operatively interconnected between said body and said base, said spring undergoing distortion when said body moves relative to said base;

means defining first and second variable volume chambers, said first and second chambers being filled with a fluid which exhibits rheopectic properties, the chamber defining means being operatively connected between said body and said base in a manner wherein displacement of said body with respect to said base induces fluid to be displaced between said first and second chambers;

an orifice operatively interposed between said first and second fluid chambers;

first and second electrodes defined in said orifice, said first and second electrodes being arranged to define a multi-passage arrangement in said orifice in a manner wherein when a voltage is applied to said first and second electrodes, the viscosity of said rheopectic fluid between said electrodes increases and the restriction to fluid flow through said orifice increases;

means for detecting the relative displacement between said body and said base;

means for detecting the frequency of the vibration being applied to said device;

a control circuit which is responsive to said relative displacement detecting means and said frequency detecting means and which utilizes the detected relative displacement to develop a vertical spring input power value and which utilizes the detected relative displacement and the detected frequency to calculate an expansive spring input force value and the timing in which the phase of the vertical spring input force and the expansive spring input force are reversed, said control circuit being arranged to determine the timing with which a voltage should be applied to said first and second electrodes.

5,065,870

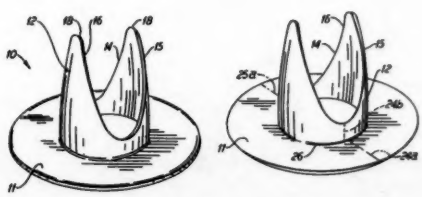
TACO HOLDER

O. Ray Conder, Jr., Charlotte, N.C., assignor to Conder Enterprises, Inc., Charlotte, N.C.

Filed Dec. 17, 1990, Ser. No. 628,496

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—13 **8 Claims**



1. A taco holder which is adapted for receiving a taco shell and supporting the same in a substantially upright position to prevent inadvertent spillage of filling materials contained within the shell, comprising:

a generally circular, flat base; and

a tubular support portion affixed to and extending upwardly from a central portion of said base, said support portion having a generally frusto-conical configuration defining an upper free end and having a slot extending laterally therethrough and which extends downwardly from said upper free end for at least a substantial portion of the height of said support portion, and such that said slot defines a pair of transversely aligned, generally U-shaped edge surfaces which are adapted to collectively support a

taco shell thereupon, wherein said base is open in the area within said support portion, so as to permit nesting of a plurality of said taco holders for compact storage.

5,065,871

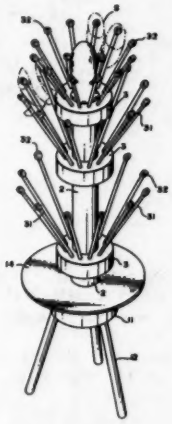
MULTI-DECK TYPE OF ROTARY SHOE RACK

Huan-Yin Chan, No. 96, Yung Shoe Road, Hsiang, Changhua Hsin Chuang Village, Yung Ching, Taiwan

Filed Mar. 26, 1991, Ser. No. 675,338

Int. Cl.[5] A47F *7/08*

U.S. Cl. 211—37 **1 Claim**



1. A multi-deck type of rotary shoe rack, comprising a base supported by a plurality of legs, a post extending from said base, a table mounted on said post above said base, and a plurality of sockets and ring-shaped rotary members alternatingly mounted on said post, and a plurality of rods for supporting shoes thereon, further characterized in that:

said ring-shaped rotary members are respectively separated from one another by said sockets, each having a plurality of holes obliquely disposed around a circle on a topmost surface thereof thereby mounting said plurality of rods therein permitting said rods to be radially projecting upwardly and outwardly from said post for mounting a shoe on each of said rod, said rods each having a chemical bag at a free end thereof, said chemical bag containing aromatics to release fragrance for eliminating odor from said shoe.

5,065,872

DUAL ACCESS STORAGE AND RETRIEVAL SYSTEM

David Simon, East Brunswick, N.J., assignor to White Storage & Retrieval Systems, Inc., Kenilworth, N.J.

Filed Oct. 5, 1990, Ser. No. 594,344

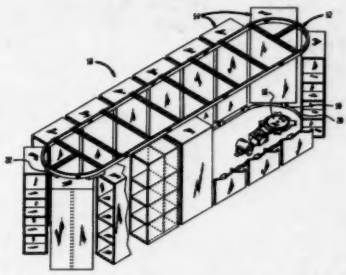
Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—122 **38 Claims**

1. A storage and retrieval apparatus, said apparatus comprising:

a. a frame; and

b. a plurality of storage racks arranged one adjacent another on said frame, at least two adjacent storage racks each having at least one storage compartment and each being so arranged on said frame as to be movable along a path between a storage position for storing articles and an access position, at least a portion of said path being arcuate, said access position of said at least two adjacent storage racks being on or adjacent said arcuate portion of said path, and said at least two adjacent storage racks being constructed and arranged with respect to each other and said frame such that the at least one storage compartment



of each said at least two adjacent storage racks can be accessed from the access position at the same time.

5,065,873

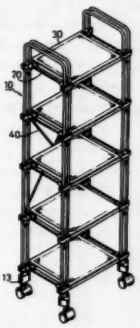
SHELF FRAME

Chun-Chu Tseng, No. 3, Ting-Hsi-Hsin, Lu-Man Ts'un, Chu-Chi Hsiang, Chiayi Hsien, Taiwan

Filed May 16, 1991, Ser. No. 701,186

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—187 **5 Claims**



1. A shelf frame comprising:

a first, a second, a third and a fourth leg means, each of said leg means having an upper and a lower end, and each including a pair of elongated rods spaced apart from one another in a parallel relationship;

clamping members to clamp said pair of elongated rods of each of said first, said second, said third, and said fourth leg means;

transverse connecting rods to interconnect one of said clamping members on said first leg means with another one of said clamping members on said second leg means, and to interconnect one of said clamping members on said third leg means with another one of said clamping members on said fourth leg means; and

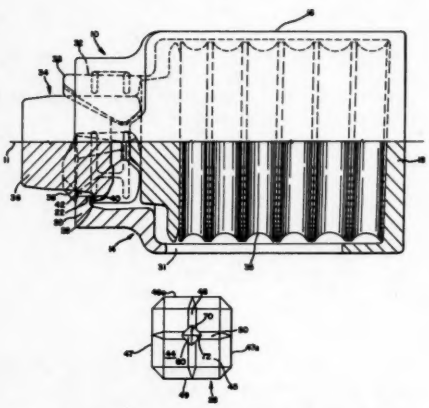
at least one rectangular plate having two opposite sides each being provided with at least one hook engaging one of said transverse connecting rods.

5,065,874

PRESHORTENING INSERT FOR A DRAFT GEAR

Ding-Huei R. Fong, Aurora, and Richard A. Carlstedt, Wheaton, both of Ill., assignors to Miner Enterprises, Inc., Geneva, Ill.

Filed Oct. 22, 1990, Ser. No. 600,876
Int. Cl.[5] B61G *9/10*
U.S. Cl. 213—31 **4 Claims**



1. A preshortening insert for the purpose of gagging a draft gear, said insert comprising:

a generally rectangular body portion, comprised of a powdered metal mixture, having all edges chamfered and having three pairs of opposite side faces;

a pair of first and second notches bisecting at least one pair of said opposite side faces, said first and second notches being generally perpendicular to each other;

a square bore having corners and first and second diagonal axes extending between pairs of said corners, extending through said generally rectangular body portion, said first and second diagonal axes being co-extensive with said first and second notches whereby when said preshortening insert is subjected to draft gear generated forces which exceed its yield point, said preshortening insert fractures, releasing said draft gear.

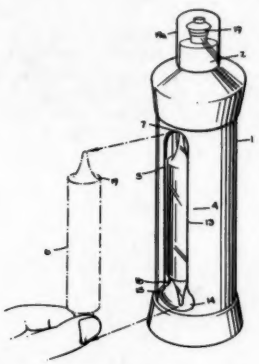
5,065,875

COMPOSITE CONTAINERS

Nancy P. Balavich, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 410,671, Sep. 11, 1989, and Ser. No. 405,838, Sep. 11, 1989. This application Jul. 3, 1990, Ser. No. 547,645
Int. Cl.[5] B65D *21/02*
U.S. Cl. 215—10 **14 Claims**

1. A composite container comprising a cylindrically shaped flat shouldered bottle having on its front face a vertical cylindrically shaped recessed cavity having vertical side edges, said cavity including a finger receiving recess and being dimensioned to receive at least one smaller container which fits completely into said recessed cavity to provide a smooth front face, protrusions located on either side of said recessed cavity on said vertical side edges, said protrusions dimensioned to permit the smaller container to be laterally snapped in and out



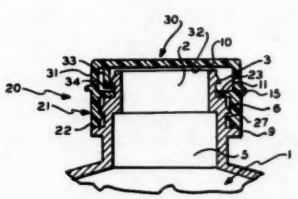
of the recessed cavity, said composite container thereby providing a single shelf keeping unit.

5,065,876

CHILD-PROOF CONTAINER AND FLIP-TOP CLOSURE FOR DRY OR FOR LIQUID CONTENTS

Michael Joyce, Rockaway, N.J., assignor to Joyce Molding Corp., Rockaway, N.J.

Filed Dec. 4, 1989, Ser. No. 445,416
Int. Cl.[5] B65D *55/02*
U.S. Cl. 215—206 **22 Claims**



1. A child-proof container having a dispensing opening; a closure for closing the dispensing opening comprising a body member and a cap member movably attached to said body member for movement between open and closed positions; a first locking means on said container for supporting and locking said body member to said container to permit rotational movement of said body member on said container; and a second locking means on said container and spaced from said first locking means for releasably locking said cap to said container to permit unlocking of said cap from said container only when the body member is rotated to an unlocking position with respect to the container; whereby said cap may be moved from a closed to an open position to permit dispensing of contents from the container.

5,065,877

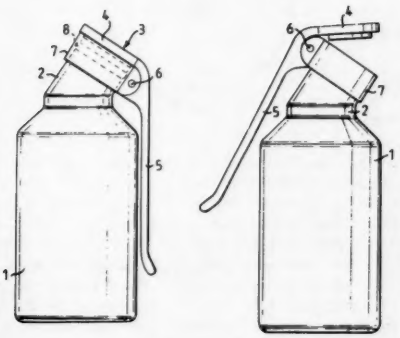
CONTAINER WITH LID

Eino Karppinen, Skiftesvaägen 38, S-183 38 Täby, and Göran Sjönell, Askrikevägen 11,, S-181 46 Lidingö, both of Sweden

Filed Oct. 16, 1990, Ser. No. 598,220
Claims priority, application Sweden, Oct. 17, 1989, 8903419
Int. Cl.[5] B65D *43/16*
U.S. Cl. 215—239 **13 Claims**

1. A container (1) having a lid part (4) which is pivotally connected (6) to the container and is provided with a handle part (5) which extends from the pivot (6) in a direction oppo-

site to a direction in which the lid part (4) extends, said container having a bottom and an outer wall which extends from said bottom, and presents at the end of said wall remote from said bottom, a neck portion (2) which is terminated with an opening, characterized in that the pivot (6) can be moved circumferentially around the neck portion (2) such that when



opening the lid part (4), the handle part (5) moves from one position in which the handle part extends essentially contiguous with the outer wall of the container such that the outer wall prevents movement of the handle part to open the lid part, to another position in which the handle part (5) is spaced further from said outer wall such that said outer wall permits movement of the handle part to open the lid part.

5,065,878

HOUSING IN PARTICULAR FOR ACCOMMODATING ELECTRICAL EQUIPMENT, WITH INTEGRABLE HINGES

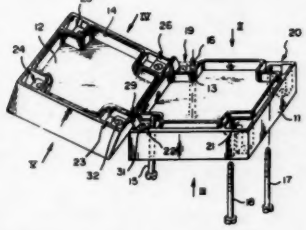
Joachim Altmann, Haendelstrasse 32, 6453 Seligenstadt; Friedhelm Rose, Mindenerweg 24 B, 4952 Porta Westfalica; Roman Schwartz, Heimelstrasse 18 B, 6601 Sbr. Ensheim, and Horst Schmitt, 3 rue de la Gare, F 67260 Wolfskirchen, all of France

Filed May 31, 1990, Ser. No. 531,078

Claims priority, application France, May 31, 1989, 89 07159

Int. Cl.[5] H02G *3/00*

U.S. Cl. 220—3.8 **3 Claims**



1. A housing comprising:

a body including a generally rectangular base and four walls joined to said base and meeting at four corners;

a cover including a generally rectangular base and four walls joined to said base and meeting at four corners;

first wall means in said body defining, with said body walls, a hollow receptacle in each of said body corners;

second wall means is said cover defining, with said cover walls, a hollow receptacle in each of said cover corners;

an outwardly projecting lip, formed on said first wall means and said body walls, enclosing said body exclusive of said hollow receptacles therein;

means defining a rabbet, formed on said second wall means and said cover walls, enclosing said cover exclusive of said hollow receptacles therein;

said lip being configured to be sealingly received in said rabbet;

said hollow receptacles of said body and said cover each being adapted to receive a mechanical fastener for fastening said cover to said body;

at least two mechanical fasteners adapted to fasten said cover to said body; and

a pair of removable hinge members for hingedly connecting said cover to said body, each of said hinge members comprising a pair of feet and a flexible strap member connecting said feet, said feet being adapted for insertion into said hollow receptacles of said body and said cover.

5,065,879

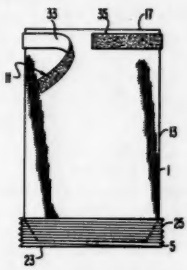
COLLAPSIBLE MULTI-LAYER INSULATOR FOR A BEVERAGE CONTAINER

Byron King, Ste. 237, Red Hook Plz., St. Thomas, V.I. 00802

Filed Jan. 14, 1991, Ser. No. 640,868

Int. Cl.[5] B65D *23/08*

U.S. Cl. 220—739 **8 Claims**



1. A multi-layer collapsible and insulative carrier for a container comprising:

an externally threaded base having top and bottom surfaces with a hole disposed in the center of said bottom surface;

a collapsible main sleeve extending upwardly from said base, said sleeve having an open upper end for receiving a container, and collapsible side and bottom walls, said side comprising an exterior fabric layer, an interior fabric layer spaced from said exterior layer, and a layer of insulating material in said space;

a base plate attached to said bottom wall of the main sleeve thereby forming a base assembly with said externally threaded base;

connecting means secured to said base plate and extending from said base plate through said bottom wall of said main sleeve and said hole in said base for interconnecting said main sleeve, said base plate and said base;

a lid having internal threads for screwing said lid over said externally threaded base, such that when said carrier is not in use said main sleeve can collapse into said base with said lid screwed on top of said base and collapsed main sleeve, thereby enclosing said sleeve, and when said carrier is to be used, said lid can be unscrewed, the sleeve extended to

receive the container, and the lid turned upside-down and screwed onto said base from the bottom thereof; and

a closure band secured to said sleeve adjacent the upper end thereof, said band being longitudinally adjustable to vary the diameter of said sleeve at the upper end thereof so that various sized beverage containers can be positioned within said sleeve and tightly engaged thereby.

5,065,880

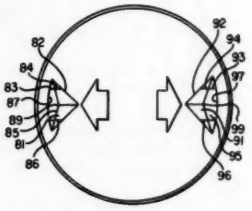
SPLASH RESISTANT CUP LID

Tom Horner, 3440 N. Beltline, No. 1066, Irving, Tex. 75062

Continuation-in-part of Ser. No. 101,353, Sep. 25, 1987, Pat. No. 4,767,019. This application Aug. 29, 1988, Ser. No. 237,873

Int. Cl.[5] A47G *19/22*

U.S. Cl. 220—711 **11 Claims**



1. A spill resistant lid having a rim structure adapted to engage a lip around the mouth of a drinking container in a substantially leak proof manner comprising:

(a) a canopy suspended from said rim structure;

(b) means for defining a vertical opening in said canopy including:

(i) a raised portion formed in said canopy; and

(ii) separation means formed in said raised portion so that a first part of said raised portion can be depressed over center to a position below said raised portion to create and maintain said defined vertical opening between a second non depressed part of the raised portion and said first depressed part of said raised portion.

5,065,881

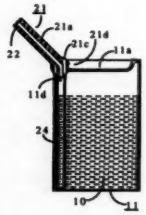
TANGS DRINKING CAN AND CAP

Min M. Tarng, 1367 Glenmoor Way, San Jose, Calif. 95129

Filed Jan. 5, 1990, Ser. No. 461,316

Int. Cl.[5] A47G *19/22*

U.S. Cl. 220—258 **7 Claims**



1. An apparatus for drinking beverage, comprising:

a container to hold the beverage, said container being sealed having a side wall, a bottom wall and a top wall, said top wall having a scotched panel and a groove, said scotched panel being connected with said groove;

an open-end spout being mounted on said top wall and being shifted to break the seal of said container by pressing said scotched panel to open a hole on said top wall, said spout having an opening to fit in the peripheral edge of said hole and forming a path for said beverage to flow out, said hole being sealed by said spout when said spout being shifted back and lying in said groove.

5,065,882

BEVERAGE CAN TOP

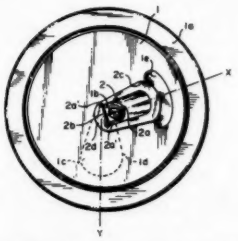
Shigeru Sugiyama, 1-9, Hisagi 7-chome, Zushi-shi, Kanagawa-ken, Japan

Filed May 16, 1990, Ser. No. 524,186

Claims priority, application Japan, May 18, 1989, 1-56480[U]

Int. Cl.[5] B65D *17/34*

U.S. Cl. 220—269 **3 Claims**



1. A can top structure of a beverage can comprising a can top and a ring attached to said can top by way of fulcrum, said can top being formed with a tear-out portion defined by a score line formed therein, a transition area between ends of said score line connecting said tear out portion to said can top, said ring having a pull side free end and a push side free end of the ring extending above the tear-out portion and adapted to be leveraged to drive part of said tear-out portion into the beverage can and tear-out said tear-out portion from said can top to form an opening when the pull side free end of the ring is pulled upward and rotated about said fulcrum, said ring extending at an angle with respect to said opening, wherein said fulcrum is located substantially at the center of the can top on a line drawn between said ends of said score line in said transition area.

5,065,883

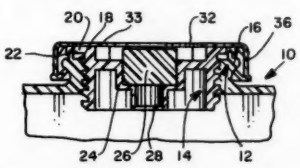
TAMPER EVIDENT CLOSURE

Theodore H. Udell, West Chester, Pa., assignor to Container Corporation of America, Clayton, Mo.

Filed Sep. 17, 1990, Ser. No. 583,474

Int. Cl.[5] B65D *51/20*

U.S. Cl. 220—276 **2 Claims**



1. A tamper evident, closure arrangement for a drum type container having a filling/dispensing opening from which extends a neck flange having a radially outwardly protruding annular ridge and which is adapted to threadably receive an internal closure plug, said arrangement including a tamper evident, unitary, plastic overcap adapted to be threadably received over said container neck flange beyond said annular ridge, said overcap comprising:

(a) a relatively thin, flat, circular, end wall having a round, center section, defined by an annular area of weakness located radially inward of the periphery of said end wall, which center section is readily detachable to provide a

round central opening arranged and disposed to afford limited access to said container neck flange closure plug;

(b) a generally cylindrical skirt extending from an outer periphery of said end wall;

(c) a plurality of circumferentially spaced, radially disposed, reinforcing ribs extending between the portion of said end wall located radially outward of said area of weakness and said skirt;

(d) a plurality of circumferentially spaced, integral projections extending radially inward from said skirt and adapted to underlie said container neck flange ridge, so that said overcap cannot be removed from said container neck flange without at least partial destruction of said overcap;

(e) said skirt projections being flexible enough to allow said overcap to be forcibly pushed over an enlarged portion of said container neck flange, and rigid enough to prevent removal of said overcap from said enlarged container neck flange portion without damage to said overcap.

5,065,884

LID OPENER AND CONTAINER USING SAME

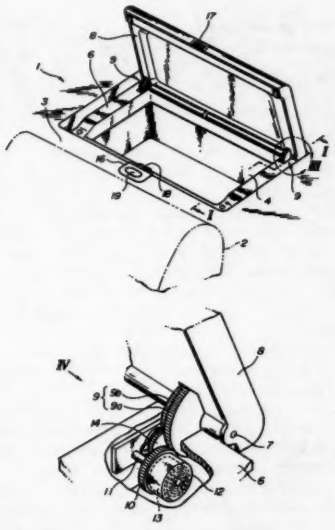
Hiromi Naritomi, Ebina, and Tsutomu Oshida, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd. and Nifco Inc., both of, Japan

Filed Dec. 26, 1989, Ser. No. 456,953

Claims priority, application Japan, Dec. 28, 1988, 63-168295[U]

Int. Cl.[5] B65D *43/26*

U.S. Cl. 220—264 **7 Claims**



1. A lid opener for opening a lid, comprising:

a frame having a first axis and a second axis which extend substantially in parallel;

a first member integrally moveable with said lid for rotation about said first axis, said first member being in the form of a sector;

a second member in engagement with said first member and rotatable about said second axis, said second member being a gear meshed with said sector; and

means for driving said second member for rotation in such a predetermined direction as to move said first member in such a direction as to open the lid, said means being constructed and arranged as to allow movement of said first and second members during closing movement of the lid:

said driving means including a flat spiral spring operatively connected between said second member and said frame about said second axis.

5,065,885

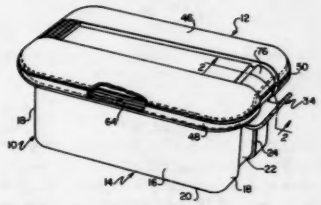
AIRTIGHT CONTAINER

Damiano Scaroni, Lumezzane-Pieve, Italy, assignor to Scaroni F.lli S.p.A., Italy

Filed Feb. 9, 1990, Ser. No. 478,157

Int. Cl.[5] B65D *45/22*

U.S. Cl. 220—326 **43 Claims**



1. A container suitable for food storage comprising:

a base having a bottom, side panels and opposed end panels integral with said bottom to form an open vessel,

said vessel having a perimeter formed at the top thereof, said perimeter having a continuous upstanding rim inside of the perimeter and extending above said vessel;

said end panels having an indented central end panel portion which meets said outer end panels at a shoulder panel, said central and shoulder panels being continuous from said bottom up to said perimeter,

a cover to fit over the open vessel to close said vessel,

said cover having a top, opposed side walls and end walls and said cover having a perimeter substantially similar to the perimeter of said vessel,

said cover having an indented central surface disposed in aligning relationship with the surface of said central end panel portion of said vessel when said cover is fitted thereupon,

said cover having a depending lip spaced inwardly from said walls,

said lip and said walls forming an annulus continuously around said perimeter of said cover,

a gasket positioned within said annulus for contact with said upstanding rim,

a closure connected to said container at said central end panel portion of said vessel and operable between said central surfaces of said cover and said central end panel portion of said vessel for applying pressure between said upstanding rim and said gasket to produce sealing contact between said rim and said gasket.

5,065,886

STRUCTURE OF DUST BIN

Chen-Hsien Sher, No. 18, Lane 195, Nan Tai Rd., Kaohsiung City, Taiwan

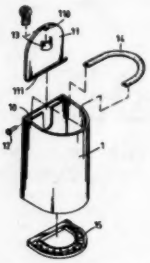
Filed Apr. 26, 1991, Ser. No. 691,813

Int. Cl.[5] B65D *43/20*

U.S. Cl. 220—331 **5 Claims**

1. A dust bin comprised of a container and a cover, said container having an opening at the top through which dust, rubbish, etc. can be put into the holding space defined inside said container, said cover being cover removably covering on said container to close said opening, and characterized in that said container has a flat, hollow chamber vertically disposed inside and separated from said holding space for receiving said cover when said cover is not in use, and two bolts at two

opposite locations for mounting said cover through hooked-joint permitting said cover to be releasably rotated on said two



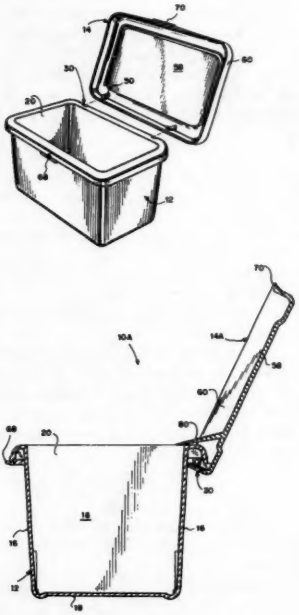
bolts from a horizontal position to a vertical position or from a vertical position to a horizontal position.

5,065,887

CONTAINER WITH HINGED COVER

Robert R. Schuh, Kaukauna, Wis.; Nancy E. Terrell, Stamford, Conn.; Walter J. Kreiseder, Barrington, and Allen J. Vogel, Long Grove, both of Ill., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 20, 1990, Ser. No. 481,589
Int. Cl.[5] B65D *43/14*
U.S. Cl. 220—338 **18 Claims**



1. A container comprising, in combination:

a container body including a plurality of interconnected side walls and a bottom wall, said container body walls defining an interior;

at least one socket member connected to said container body, said socket member including spaced, generally opposed first and second socket walls defining a passageway having a wider end and a narrower end with an opening proximate to said wider end, said first socket wall defining a receptable residing proximate to said narrower end and said second socket wall defining a contract surface; and

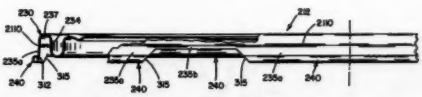
a cover attachable to said container body, said cover including a top cover panel and at least one pivot member operatively associated with said top cover panel, said pivot member including a support arm and a projection projecting from said support arm, said support arm being engageable with said contact surface and said projection being positionable in said receptacle when said support arm is in the passageway and located between said first and second socket walls said support arm extending through said wider end of said passageway and into said narrower end when said cover is in a closed position on said container body.

5,065,888

IMPROVED RINGLESS PAINT CONTAINER WITH STEP DOWN LID

Thomas A. Gallagher, Chagrin Falls, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 528,531, May 25, 1990, which is a continuation-in-part of Ser. No. 335,566, Apr. 10, 1989, Pat. No. 4,936,482, which is a continuation of Ser. No. 120,471, Nov. 13, 1987, Pat. No. 4,880,131. This application Dec. 18, 1990, Ser. No. 629,431
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] B65D *45/00*
U.S. Cl. 220—355 **10 Claims**



1. The combination of a ringless metal container and a lid comprising:

a) said container having a cylindrical body portion, a beaded opening defining the mouth of said container and a rim portion extending longitudinally from said body portion to and including said beaded opening; said mouth smaller in diameter than said body portion so that said rim portion tapers radially inwardly; stiffening means of the juncture of said rim and body portions for stiffening said rim and said mouth against longitudinal deflection;

b) said lid having a generally circular configuration with an annular sealing groove formed therein, said sealing groove defined by longitudinally extending inner and outer sealing walls and an annular bight wall extending therebetween; and

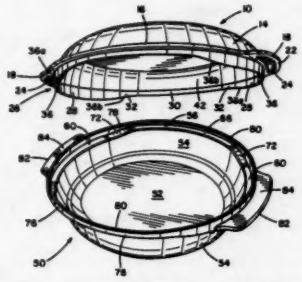
c) collapse preventing means formed in said outer sealing wall of said lid and acting in conjunction with said stiffening means for preventing deformation of said mouth and rim portion in the event of excessive sealing forces applied to said lid while providing pry openings for removal of said lid wherein said stiffening means includes an annular stiffening groove formed at the juncture of said body portion and said rim portion; said collapse preventing means includes said outer sealing wall of said lid having a plurality of longitudinally extending long lenth and short length sections, each section extending for discrete arcuate increments about the circumference of said outer sealing wall, said long length sections having a longitudinal distance sufficient to contact said annular stiffening groove when said excessive sealing force is applied to said container, said short length sections have a longitudinally extending distance which maintains a pry gap between said annular stiffening groove and said short length section whereby removal of said lid is possible notwithstanding permanent deformation of said container.

5,065,889

COVERED DISH WITH VENT

Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Aug. 3, 1990, Ser. No. 563,127
Int. Cl.[5] B65D *51/00*
U.S. Cl. 220—366 17 Claims



1. An apparatus for cooking, serving and storing food and the like, comprising:

a dish having a bottom wall and a sidewall, said bottom wall and sidewall defining a dish interior;

a cam ledge on said sidewall peripherally about said sidewall;

a cover having a top wall and a sidewall, a lip extending downwardly from said cover sidewall peripherally about said cover;

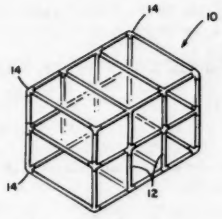
said cover being selectively rotatable in opposed directions and vertically movable on said cam ledge between an unvented position wherein said lip engages said cam ledge peripherally about said dish to block access to the interior of the dish between said dish and said cover and a vented position wherein said cover is generally elevated relative to said dish and said lip partially engages said cam ledge to allow access to the interior of the dish; said lip, in the vented position of said cover, being in point contact with said cam ledge at a pair of points on said ledge aligned transversely across said dish and defining a pivot axis, said cover being pivotally movable about said axis to selectively pivot the cover from the dish and define a venting space therebetween.

5,065,890

COMPLY SYSTEM

George Greenbaum, 1005 N. Caribe Ave., Tucson, Ariz. 85710

Continuation-in-part of Ser. No. 559,311, Jul. 30, 1990, Pat. No. 5,022,555. This application Jan. 2, 1991, Ser. No. 636,622
Int. Cl.[5] B65D *7/00*
U.S. Cl. 220—401 17 Claims



1. A container which comprises:

a liner having longitudinal members compressively secured together by a first carrier film;

at least one water-impermeable barrier film overlying the liner;

a second carrier film overlying the barrier film to form a container; and

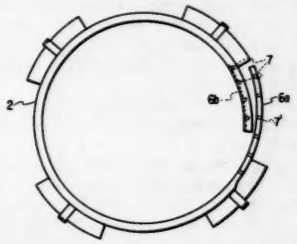
at least some of the longitudinal members comprising specially extruded members, said specially extruded members comprising at least first and second members, one received within the other for the entire length thereof, the members joined together to function as an integral unit.

5,065,891

REMOVABLE OR FIXED INNER RING DEVICE FOR TRASH RECEPTACLE LINERS

Robert G. Casey, 7853 Blue Gray Cir., Manassas, Va. 22110

Filed Jul. 19, 1990, Ser. No. 554,446
Int. Cl.[5] B65D *67/04*
U.S. Cl. 220—404 3 Claims



1. An inner ring mechanism for supporting a flexible bag liner inside a trash receptacle, said trash receptacle having a main body with a closed bottom and an open top with a rim, said inner ring comprising:

means for mounting said inner ring on said rim of said receptacle, wherein said inner ring is disposed within an upper portion of said receptacle and has a diameter slightly smaller than the diameter of said receptacle; and

a plurality of flared portions defined on predetermined positions along the circumference of the inner ring, wherein gaps for venting air are disposed along the circumference of the inner ring between said flared portions, thereby enabling a release of trapped air upon insertion of said flexible bag liner into said receptacle, said flared portions extending outwardly toward the main body of said receptacle;

wherein an opening is defined between said inner ring and said mounting means, such that a top portion of said bag liner can be inserted within said opening when said inner ring is mounted within said receptacle and said bag liner is inserted into said trash receptacle, thereby supporting said bag liner and preventing the bag liner from overhanging on the exterior of the receptacle;

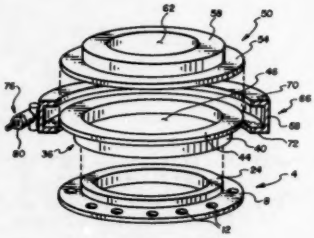
said inner ring further comprising means for selectively adjusting a circumferential size of the inner ring, wherein said means for selectively adjusting the circumferential size of the inner ring comprises a full length slit in said inner ring which defines selectively overlapping longitudinal edges of said inner ring, one of said overlapping edges of said inner ring comprising a plurality of slots, the other of said overlapping edges of said inner ring comprising a plurality of protruding snap means, said snap means being selectively insertable into said slots to define different circumferential sizes of said inner ring, whereby said inner ring can be adapted to receptacles of various sizes.

5,065,892

STRUCTURE FOR MOUNTING LIQUID LEVEL SENSORS AND THE LIKE IN LIQUID CONTAINERS

Rudy Lukez, Salt Lake City, Utah, assignor to Edo Corporation, Salt Lake City, Utah

Filed Aug. 27, 1990, Ser. No. 573,492
Int. Cl.[5] B65D 25/00
U.S. Cl. 220—465 5 Claims



1. In a liquid container having an opening, about the perimeter of which is mounted an annular bracket for receiving a liquid level sensor, said sensor having a laterally extending lip for seating on the bracket to allow part of the sensor to be exposed through the opening,

fastening apparatus for releasably holding the sensor in the bracket comprising

an annular bracket extension projecting upwardly from the bracket, said extension having a laterally projecting flange at its upper end,

a holding ring dimensioned to overlie the sensor lip and hold the sensor in place in the bracket, said ring mating and being generally coextensive with the flange, and

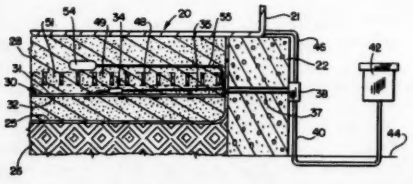
a band clamp means for releasably clamping the ring to the extension.

5,065,893

CATHODIC PROTECTION SYSTEM AND METHOD FOR ABOVE-GROUND STORAGE TANK BOTTOMS

David H. Kroon, Spring; Gary Goldsmith, Conroe; Michael K. Baach, Spring, all of Tex., and James B. Bushman, Medina, Ohio, assignors to Corrpro Companies Inc., Medina, Ohio

Filed Mar. 15, 1991, Ser. No. 669,934
Int. Cl.[5] B65D 1/42
U.S. Cl. 220—565 45 Claims



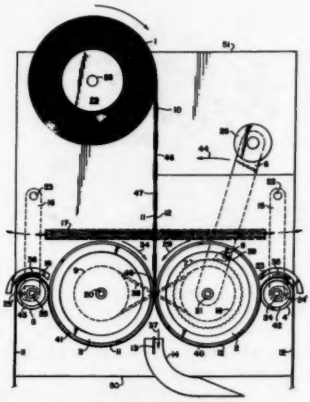
1. In combination, an above-ground storage tank having a metal bottom, a leak containing dielectric safety membrane spaced a short distance below and extending beneath the tank bottom generally parallel thereto, compacted electrolytic backfill positioned between the membrane and the tank bottom supporting the tank bottom, a horizontally disposed cathodic protection anode between the membrane and tank bottom, said anode being in the form of a grid of interconnected bars and ribbons, and a mesh dielectric insulator embedded in the electrolytic backfill and positioned between the anode and tank bottom operable to keep any portion of the anode from contacting the tank bottom and to maintain a generally uniform spacing between the anode and tank bottom.

5,065,894

DISPENSER FOR BANDAGES

Patricia A. Garland, 1618 Milton St., Tallahassee, Fla. 32303

Filed Mar. 19, 1990, Ser. No. 495,598
Int. Cl.[5] B65H 5/28
U.S. Cl. 221—25 20 Claims



1. A dispenser for individual adhesive tape bandages from an elongated strip package of said adhesive tape bandages including two outside strips of paper sandwiching therebetween a plurality of spaced adhesive tape bandages; said dispenser including a supply spool to hold a roll of said bandages in an elongated strip package, two press rollers aligned and spaced apart so as to receive said strip therebetween, two paper stripping rollers biased respectively against said press rollers and each adapted to receive separate ones of said outside strips of paper and direct them to waste disposal; a manually operated ratchet means attached to one of said press rollers to cause it to rotate and advance said strip passing between said rolls; means to transfer the rotation of said one press roller into an equal and opposite rotation of the other said press roller; and an outlet located beneath said press rollers for receiving a freely falling said adhesive tape bandage released from said outside strips of paper upon manual operation of said ratchet means.

5,065,895

VARIABLE SUPPORT FOR FAN-FOLDED PAPER DISPENSER

Raymond F. De Luca, Samford, Conn., and Paul W. Jespersen, Houston, Tex., assignors to Georgia Pacific Corporation, Atlanta, Ga.

Filed Aug. 2, 1989, Ser. No. 388,396
Int. Cl.[5] A47K 10/24
U.S. Cl. 221—54 12 Claims

1. A dispenser for use with at least one stack or package of flexible sheet material comprising:

a housing having a horizontally-disposed lateral axis adapted for attachment to a wall;

low-friction support means operatively connected to said housing to decrease the friction on the bottommost sheet of flexible material as the user pulls such sheet from said housing; and

lateral pressure means operatively connected to said housing to provide force to the stack along the lateral axis of said

housing thereby decreasing the vertical pressure and the corresponding friction on said support means and such

sheet material, said force proportional to the weight on said support means.

5,065,896

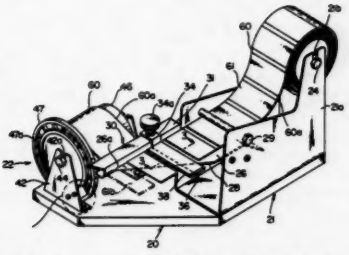
LABEL DISPENSER

Donald Jurgich, P.O. Box 1575, Poulsbo, Wash. 98370

Filed Jan. 25, 1991, Ser. No. 646,077

Int. Cl.[5] B65H *5/28*

U.S. Cl. 221—73 **13 Claims**



1. A label dispenser for stripping adhesive-backed labels from a dispensing strip, comprising:

a frame;

strip supporting means on the frame for supporting a said dispensing strip;

a table on said frame projecting in a longitudinal lead direction from said strip supporting means, said table having a stripping edge at its lead end extending at an acute angle to said lead direction between a back longitudinal table edge and a shorter front longitudinal table edge; and

a take-up reel on said frame behind said back longitudinal table edge for receiving a dispensing strip passing rearward beneath said table after removal of labels therefrom responsive to passage of the dispensing strip over said stripping edge after traveling over said table from said strip supporting means.

5,065,897

UNIVERSAL DISPENSING APPARATUS FOR STACKED ARTICLES

Robert D. Smith, 209 Rustic Dr., North Huntingdon, Pa. 15642

Filed Oct. 25, 1990, Ser. No. 603,239

Int. Cl.[5] B65G *59/00*

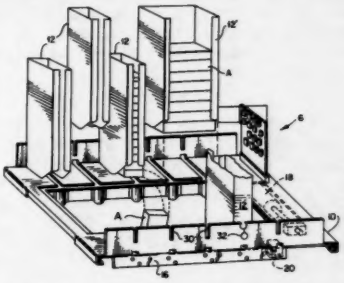
U.S. Cl. 221—130 **12 Claims**

1. A dispensing module for dispensing a plurality of articles, said module comprising:

a generally horizontally extending support plate having a central opening at least as large as the largest of the articles to be dispensed,

a plurality of generally vertically extending article holders disposed on said support plate for holding a stack of said articles such that the lowermost articles of the stack are supported by a support portion of the support, and

dispensing means for selectively withdrawing articles from said article holders and for conveying articles withdrawn from said article holder relative to said support plate such that a withdrawn article drops through said central opening of said support plate to thereby be dispensed, said dispensing means comprising a shuttle plate disposed below, and parallel to, said support plate and having a



central opening therein at least as large as the largest of said articles, shuttle plate movement means for moving said shuttle plate in a plane generally parallel with said support plate, and engagement means on said shuttle plate for selectively engaging said articles in said stack holders such that movement of said shuttle plate by said movement means causes an article engaged by said engagement means to be conveyed from said support portion of said support plate to said central opening of said support plate for dispensing therethrough.

5,065,898

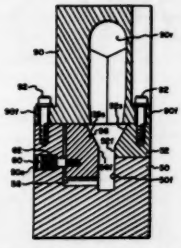
APPARATUS FOR ORIENTING AND INJECTING FASTENERS

David Michalewski, Buffalo, and Bradley M. Roberts, Williamsville, both of N.Y., assignors to Gemcor Engineering Corporation, Buffalo, N.Y.

Filed Oct. 9, 1990, Ser. No. 594,339

Int. Cl.[5] B65H *1/00*

U.S. Cl. 221—171 **13 Claims**



1. Apparatus for orientating and injecting fasteners (F) into fastener grasping fingers (**46**), the fasteners being received from a non-dedicated feed tube (**18**) through which a variety of fasteners may be propelled from a fastener selection apparatus, the fasteners having heads (h) and tails (t) of differing diameters; said apparatus comprising in combination:

a mounting frame (**20**);

adjustable orientation means (**12**) mounted on the frame for orienting and discharging fasteners, the orientation means having retaining means (**98**) for retaining an end of the non-dedicated feed tube (**18**), spaced apart jaws (**50**, **52**, and **56**) the spacing of which may be adjusted for orientat-

ing fasteners having differing diameter tails received from the non-dedicated feed tube, the orientation means further having a discharge opening (**114***a*) through which the oriented fasteners may be discharged;

a dedicated feed tube assembly (**16**) having receiving and discharge ends (**116, 188**) the receiving end being interconnected with the discharge opening of the orientation means; and

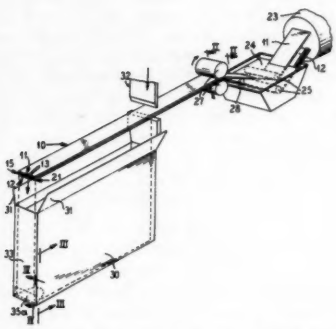
adjustable injection means (**14**) mounted on the frame for injecting fasteners, the injection means having retaining means (**212**) for retaining the discharge end of the dedicated feed tube, a pair of spaced apart jaws (**228, 230**) the distance between the jaws being adjustable for receiving fasteners having tails of differing diameters, and a injector knife (**226**) for pushing the fastener into fastener grasping fingers (**46**).

5,065,899

SECTIONAL OR PRE-CUT ZIPPER STRIPS, MAGAZINE STORAGE AND FEED MEANS, AND METHOD

Paul Tilman, New York, N.Y., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Oct. 17, 1989, Ser. No. 422,734
Int. Cl.[5] **A47F** *1/04*
U.S. Cl. 221—305 **27 Claims**



1. An extruded plastic zipper assembly comprising:

a pair of opposingly aligned matching zipper strips having complementary reclosable interlocked zipper profiles with laterally extending confronting webs; and

complementary non-zipper stabilizing rib means on said webs cooperating with one another and with said interlocked profiles for maintaining said webs substantially parallel to one another so that said assembly can be stacked in substantially uniform parallel relation with like zipper assemblies;

said zipper strips having sufficient stiffness along their linear length to remain substantially straight when stacked and when supported in cantilever fashion and permitting the strips to remain substantially straight as they are fed forward to be cut and dropped and stacked in a receiving package.

5,065,900

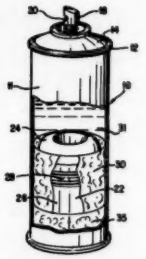
BARRIER CAN PREFILL SEAL

Christian T. Scheindel, Star Route-Ridge Rd., Randolph Center, Vt. 05061

Filed Jan. 12, 1990, Ser. No. 464,114
Int. Cl.[5] **B65D** *83/14*
U.S. Cl. 222—1 **9 Claims**

1. A pressurized piston operated product dispensing container having a cylindrical body, a bottom wall and a valve cap within which a cup shaped annular free piston is positioned to divide the container into an upper product containing chamber and a lower propellent containing chamber, the improvement in a sealing mechanism comprising:

said piston having an annular cylindrical sidewall with an outer diameter less than the inner diameter of said cylindrical body to provide an annular gap between piston sidewall and body wall,



a sealant material, distinct from the product in the upper chamber, filling said annular gap between the sidewall of said piston and the sidewall of said can,

said sealant material substantially preventing propellent from migrating around the wall of said piston into the product in said upper chamber,

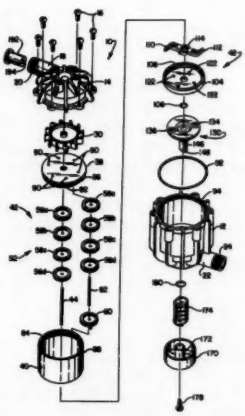
said sealant material being sufficiently fluid to provide a base on which said piston rides up when product is dispensed.

5,065,901

APPARATUS FOR MONITORING A FLOW OF FLUID THROUGH A FILTER MEDIUM

Earl P. Brane, Rte. One Box 88, Hideaway Hills, Ohio 43107, and Douglas K. Brane, 205 Poinciana La., Largo, Fla. 34640

Continuation-in-part of Ser. No. 507,352, Apr. 9, 1990. This application May 10, 1991, Ser. No. 698,612
Int. Cl.[5] **B67D** *5/30*
U.S. Cl. 222—20 **21 Claims**



1. Apparatus for monitoring a flow of fluid through a conduit, comprising:

a housing having an input port and an output port, connectable with said conduit;

a turbine chamber within said housing in fluid communication with said input port for receiving fluid under pressure;

a gear chamber within said housing adjacent said turbine chamber;

a gear housing assembly positioned within said gear chamber and including:

a gear housing body having a top including a shaft bearing and a bottom having a gear train output opening and a shaft receiving opening,

a drive shaft extending through and supported by said shaft bearing and positioned within said shaft receiving opening,

a reduction gear train having a first gear array mounted for rotation upon said drive shaft and a second gear array operatively emmeshed with said first gear array to derive a predetermined reduction ratio, said gear train having an eccentric output component at said gear train output opening, and

a rotational drive component mounted for rotation upon said gear housing body bottom, movable in select correspondence with said eccentric output component and having a valve drive portion;

a turbine mounted upon said drive shaft within said turbine chamber, rotatable by fluid incident thereon from said input port and coupled in driving relationship with said reduction gear train;

a valve seat within said housing adjacent said output port and including an open valve cam surface, and a valve closing detent portion;

a rotatable valve member mounted within said housing, having an upwardly disposed driven portion slideably engageable with said rotational drive component valve drive portion, further having a valve closure portion extending therefrom including a camming stem slideably movable upon said valve cam surface to retain said valve closure portion in an open valve orientation and movable into said valve seat detent portion to effect blockage of fluid flow through said output port; and

reset means for repositioning said rotatable valve camming stem upon said cam surface to effect opening said valve for permitting the flow therethrough of a predetermined quantity of fluid.

5,065,902

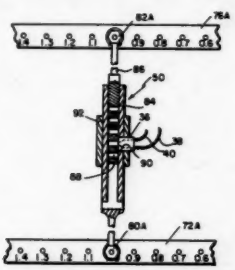
PNEUMATIC MATERIAL DISPENSING MONITOR

John G. McNab, Quebec, Canada, assignor to Graves Spray Supply, Inc., Clearwater, Fla.

Filed May 25, 1990, Ser. No. 528,424

Int. Cl.[5] B67D *5/22*; G01G *9/00*

U.S. Cl. 222—31 **19 Claims**



1. A system for determining the weight of material dispensed by a dispenser having a pump, said system comprising:

first and second telescopic members;

an encoder on said first member and a sensor on said second member;

calibration means adjustably mounting said first and second members between a pump and a first securement for determining displacement of one of said members for a cycle of said pump as a function of specific gravity of material being dispensed; and

determining means for determining weight of material dispensed from signals from said sensor.

5,065,903

FLUID DELIVERY SYSTEM FOR CONTROLLING FLUID FLOW

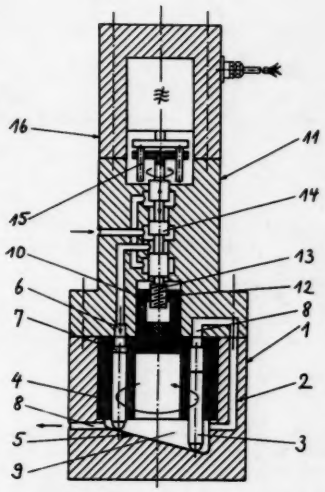
Hans W. Meinz, Kockerellstrasse 19, 5100 Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 362,447, May 30, 1989, abandoned. This application Jan. 14, 1991, Ser. No. 639,749

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3640980

Int. Cl.[5] B67D *5/16*

U.S. Cl. 222—71 **10 Claims**



1. A delivery system for controlling the flow of a fluid, said delivery system comprising:

a hydraulic motor having:

an inlet,

an outlet,

a shaft,

piston means operable, when hydraulic fluid under pressure is introduced into the inlet, to cause rotation of said shaft at a rate which reflects the actual rate at which fluid is flowing through the system and out of said outlet, and

chamber means for receiving fluid after it has caused rotation of said shaft and before it is discharged from the motor, wherein, during operation of said hydraulic motor, said outlet and said chamber means are in constant communication, and

valve means for controlling the actual rate of flow of a fluid through the system, said valve means including

an inlet for fluid,

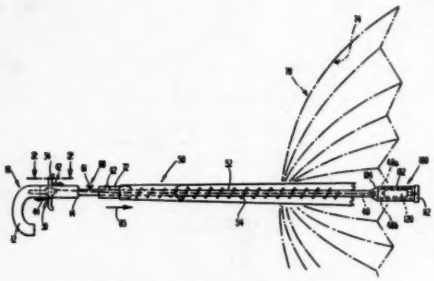
an outlet which is connected to said hydraulic motor inlet,

a valve interposed between said inlet and said outlet for controlling the actual rate of fluid flow through the system,

an electric motor having a shaft and associated electric motor control means for causing the electric control motor to rotate at a rate which reflects a desired rate of fluid flow through the system, and

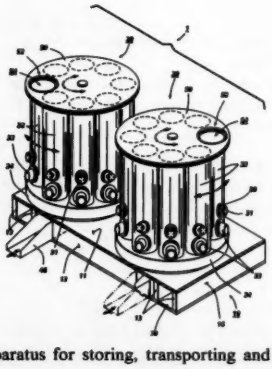
dynamic coupling means for connecting said hydraulic motor rotatable shaft, said electric motor rotatable shaft and said valve means so that, when there is a difference between the desired rate of fluid flow through the system and the actual rate of fluid flow through the system, the valve means are modulated to eliminate the difference.

5,065,904
PERSONAL PROTECTION DEVICE
Joseph T. McCaffrey, 709 Knorr St., Philadelphia, Pa. 19111, and Stewart P. McKay, 1091 Kemper Dr., Warminster, Pa. 18946
Filed Sep. 21, 1989, Ser. No. 410,715
Int. Cl.[5] B67D 5/00
U.S. Cl. 222—3 21 Claims



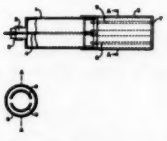
1. A personal protection device, comprising:
(a) a handle having movable trigger means connected thereto;
(b) wherein said trigger means comprises:
(1) a stud affixed to said handle;
(2) a collar slidably disposed about said stud;
(3) a pair of radial projections extending from said collar; and
(4) a pair of detent arms pivotally mounted to said handle and positioned to selectively engage said radial projections;
(c) an elongate shaft connected to said handle and longitudinally extending therefrom;
(d) canister means connected to said shaft at a terminal end thereof remote from said handle, said canister means having actuator means for actuating the discharge of a canister; and
(e) a cable operably connecting said trigger means to said actuating means whereby upon movement of said trigger means, said actuator means is actuated to cause the discharge of a canister.

5,065,905
HARDWARE DELIVERY SYSTEM
James A. Eddy, Rochester, N.Y., and Alan N. Keller, Alexandria, Va., assignors to Xerox Corporation, Stamford, Conn.
Filed May 23, 1990, Ser. No. 527,407
Int. Cl.[5] B67D 5/60
U.S. Cl. 222—132 7 Claims



1. An apparatus for storing, transporting and discharging articles to operators located at a plurality of workstations, comprising:
a base support member;
at least one storage unit including a plurality of storage containers indexably mounted on said base support member for storing articles therein, each of said storage containers including a discharging means for operator actuatable article discharging therefrom;
means for receiving articles from said discharging means, said receiving means including a retractable tray mounted on said base support member for receiving articles discharged from a selected one of said plurality of storage containers, whereby a selected one of said storage containers is indexed to said receiving means for discharging articles therein; and
means for transporting said base support member including said at least one storage unit and said plurality of storage containers to each of the plurality of workstations.

5,065,906
DOUBLE-CHAMBERED CARTRIDGE HAVING SEMI-CYLINDRICAL PISTONS FOR USE IN A PRESS-OUT GUN
August Maeder, Hurdnerwaeldli Strasse 42, 8808 Pfaeffikon/Sz, Switzerland
Filed Oct. 13, 1989, Ser. No. 421,169
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3835093
Int. Cl.[5] B65D 83/00
U.S. Cl. 222—137 6 Claims



1. An apparatus for extruding stored fluid contents of a single cylindrical cartridge having a side wall and a longitudinal partition wall defining dual semicylindrical chambers, each chamber having corresponding closeable outlet openings and corresponding inlet openings which are closed by corresponding plungers slidably disposed therein, comprising:
a cylindrical tube having an open end, a side wall adapted to slidably engage the external periphery of the cartridge in a closely fitted relation, and a closed end having an end wall; and
a pair of pistons each being in the form of a semicylindrical sleeve upstanding from the end wall and disposed concentrically inside the cylindrical tube, the pistons being spaced apart defining a space therebetween, the space being coplanar with the partition wall to permit sliding of the tube longitudinally along the cartridge.

5,065,907
INSTANT SEALING SPRAY CANISTER
Ernest W. Allen, 607 E. Miller Rd., Midland, Mich. 48640
Continuation-in-part of Ser. No. 360,105, Jun. 1, 1989, abandoned. This application May 17, 1990, Ser. No. 530,106
Int. Cl.[5] B67D 5/06
U.S. Cl. 222—183 1 Claim

1. A spray canister comprising an outer housing and an inner housing, each housing having a concave base, the base of said inner housing being adapted to mate with the base of said outer housing, said outer housing having first and second oppositely disposed openings, said first opening being adapted to receive said inner housing, said outer housing having a top portion fitted with spring means and sealing means, and having inlet means for applying air pressure to said inner housing and means adapted for operative connection with a spraying head

for dispensing material from said inner housing, said inner housing to receive a vial of material to be sprayed and having

a top portion adapted to instantly sealingly contact the sealing means of said outer housing when said inner housing is inserted in said outer housing.

5,065,908

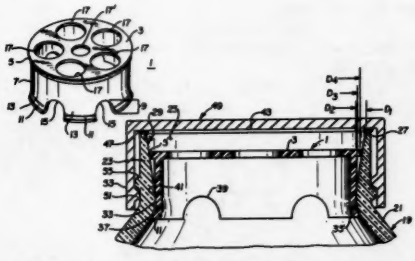
DISPENSING FITMENT AND CONTAINER THEREFORE

Gary L. Mengeu, Wheeling, W. Va., assignor to Continental Plastics, Inc., Triadelphia, W. Va.

Filed Jan. 16, 1991, Ser. No. 642,028

Int. Cl.[5] B65D *3/00*; B67D *47/06*

U.S. Cl. 222—480 **14 Claims**



1. A fitment for a container having a body portion and a neck on said body portion terminating in a rim and defining a generally cylindrical opening having a tapered portion which tapers from a maximum diameter at said rim to a minimum diameter at an inflection point, and a flared portion which flares outward in diameter towards said body portion from the minimum diameter at said inflection point, said fitment comprising:

a circular end wall with at least one dispensing opening therein, and having a peripheral edge with a diameter which is between said maximum and minimum diameters of said opening; and

a cylindrical skirt extending axially from and spaced radially inward from said peripheral edge of said end wall, and terminating in a terminal portion which flares radially outward to a diameter greater than said minimum diameter at a free edge;

said fitment seating in said cylindrical opening in the container neck with said peripheral edge on said end wall wedged against the tapered portion of said opening at a point spaced from said rim of said neck, with said cylindrical skirt extending through the inflection point in said opening, and with said terminal portion of said skirt flared radially outward into engagement with said flared portion of said opening.

5,065,909

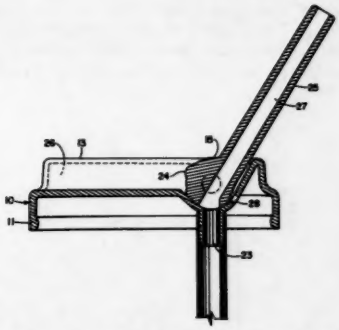
VENTED BEVERAGE CAN COVER HAVING PIVOTAL SPOUT

Giovanni Pino, Kentwood, Mich.; Thomas W. Scherer, Mansfield, and Ruth A. Stephens, Norton, both of Ohio, assignors to Threeco, Barberton, Ohio

Filed Nov. 29, 1989, Ser. No. 443,488

Int. Cl.[5] B67D *3/00*

U.S. Cl. 222—484 **2 Claims**



1. A cover assembly for a beverage container, said cover assembly including a cap engageable with a standard container, said cap providing an outlet passage traversing said cap, said cover assembly also including a valve member having a tubular lever portion and rotatably mounted on said cap for movement between a position closing said passage and a position opening said passage to communication with said tubular lever portion, wherein the improvement comprises:

means forming a vent opening in said cap, said valve being adapted to open said vent opening with said valve in position to open said passage, and close said vent opening with said valve in position to close said passage, said valve having protrusions engaging said passage and vent opening in said closed position, said cap having a wall forming a recess of cylindrical curvature having an axis, and said vent opening and outlet passage traversing said cap at said recess, said valve having a configuration providing a vent passage exclusively within said recess communicating with said vent opening in said open position.

5,065,910

DISPENSER HEAD FOR FLOWABLE MATERIALS

Edgar F. Fiedler, 147 Avenue, Nobleton, Ontario, Canada

Filed Feb. 7, 1990, Ser. No. 476,319

Claims priority, application Canada, Jun. 30, 1989, 604552

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—504 **7 Claims**

1. A dispenser apparatus for flowable materials supplied under pressure to said dispenser apparatus and comprising:

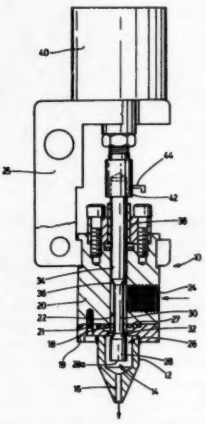
a dispensing head defining a dispensing chamber having an inlet opening and a discharge opening, and defining a predetermined volume;

plunger means having a predetermined plunger diameter adapted to be positioned in an open position in said dispensing chamber, for occupying a portion of said predetermined volume thereof, and being at least partially removable from said dispensing chamber;

a supply chamber for supplying said flowable material to said inlet opening of said dispensing chamber, said material flowing directly from said supply chamber to said inlet opening, and through said dispensing chamber around said plunger means, and out of said discharge opening, said supply chamber having a supply opening communicating directly for receiving said flowable material under pressure;

plunger operating rod means having a predetermined rod cross-section extending through said supply chamber and through said inlet opening of said dispensing chamber, said plunger operating rod means being of reduced cross-section in relation to said plunger means, whereby said flowable material flows directly from said supply chamber under pressure directly through said inlet opening around said plunger operating rod means, when said plunger means is in said open position in said dispensing chamber;

means for progressively withdrawing said plunger means from said dispensing chamber into said inlet opening to close said inlet opening and prevent further flow of said material through said inlet opening and said means for progressively withdrawing said plunger means being



operable to further withdraw said plunger means from said dispensing chamber thereby causing material in said discharge opening to be sucked back into said dispensing chamber;

bearing sleeve means communicating with said supply chamber, and,

collar means connected with said plunger operating rod means and extending through said bearing sleeve means into said supply chamber, said collar means having a predetermined diameter substantially equal to said predetermined diameter of said plunger means, and greater than said predetermined cross-section of said plunger operating rod means whereby pressure of said flowable material in said supply chamber is applied substantially equally to said plunger means and to said collar means.

5,065,911

TWO-PIECE DISPENSING CLOSURE WITH CANTILEVERED BIASING MEMBER

Robert D. Rohr, Elgin, Ill., and Lawrence R. Kitterman, Bradenton, Fla., assignors to Seaquist Closures, Crystal Lake, Ill.

Filed May 14, 1990, Ser. No. 523,133

Int. Cl.[5] B67D *3/00*

U.S. Cl. 222—517 **11 Claims**

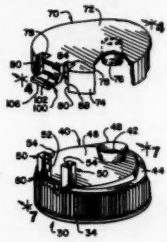
1. A two-piece snap-action closure which can be readily assembled for use on a container defining an opening communicating with the container interior, said closure comprising:

a body for being mounted to said container over said container opening, said body defining a dispensing orifice for communicating at said container opening with said container interior;

a lid separate from said body;

mounting means for mounting said lid on said body for pivoting between a closed position occluding said dispensing orifice and an open position spaced away from said dispensing orifice;

a resiliently deformable biasing member extending from a first location on one of said lid and body and having a distal end for engaging the other of said lid and body at a second location, said biasing member having a range of movement with a stable position at each end of the range on either side of an over center point; and



restraining means on said other of said lid and body for restraining said distal end of said biasing member at said second location whereby said biasing member is most stressed when said lid is at said over center point between said open and closed positions to thereby bias said lid toward one of said open and closed positions.

5,065,912

BIASED SWIVEL CLOSURE

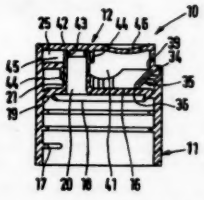
Karl-Heinz Rosenthal, Reichshof, Fed. Rep. of Germany, assignor to Bielsteiner Verschlusstechnik GmbH, Gummerbach, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,284

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922258

Int. Cl.[5] B67D *3/00*

U.S. Cl. 222—517 **6 Claims**



4. A closure for a container defining an opening communicating with the container interior from which material can be dispensed, said closure comprising:

a cap for being mounted on said container over said opening, said cap defining a peripheral wall and a coverplate which is recessed from the end of said wall and which extends over said container opening, said coverplate defining a discharge opening for communicating with the container interior;

a cover pivotally mounted within said peripheral wall on said cap over said coverplate for being pivoted between a closed position occluding flow through said discharge opening and an open position permitting flow through said discharge opening; and

a spring device connecting said cap and cover to force said cover toward said closed position, said spring device having a pair of legs each having a first end connected together, said legs generally diverging from each other in the unstressed state of said device when said cover is removed from said cap, one of said legs being pivotally connected at a second end to said cap and the other of said legs being pivotally connected at a second end to said

cover, said legs having a less divergent configuration when said cover is mounted in said cap in the closed position with said connected first ends engaging said coverplate.

5,065,913

POURING AND DISPENSING SPOUT FOR A CONTAINER

Thomas H. Glasener, 10185 Marquart Rd., New Carlisle, Ohio 45344

Filed Apr. 3, 1990, Ser. No. 503,729
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—528 **8 Claims**

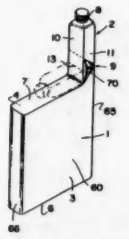
1. A pouring and dispensing spout in combination with a liquid container having a tubular neck portion with external helical threads and a circular surface adjacent said threads, said spout including an elongated one-piece and dip-molded tubular body of resilient and flexible rubber-like material and defining an internal passage, said body having a generally uniform wall thickness and including an enlarged annular inlet portion and a smaller annular outlet portion, said inlet portion having a removable friction engagement with said neck portion of said container and adapted to be pressed axially onto said neck portion, said inlet portion of said body also having a peripherally extending annular rib forming a liquid-tight seal with said circular surface of said neck portion, and said body having an annular intermediate wall portion which collapses to close said passage in response to pinching said wall portion with a user's fingers to permit inverting said container and then controlled dispensing of the liquid from said container.

5,065,914

ONE-PIECE CONTAINER WITH A POURING TUBE, MADE FROM A THERMOPLASTIC MATERIAL

Jean-Louis Chollet, Lyons, France, assignor to Etablissements Marius Millet & Cie, Pratz, France

Filed Jun. 29, 1990, Ser. No. 545,828
Claims priority, application France, Jun. 30, 1989, 89 09446
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—529 **14 Claims**



9. A container molded as a single piece from a thermoplastic material, comprising:

a hollow storing body having a top wall;

a pouring tube connected to said hollow storing body and comprising a pivoting section whereby at least a portion of said pouring tube is folded down against said top wall in a stored position and raised angularly by about 90° relative to said top wall in a use position when corresponds to a position in which said container is molded;

said pivoting section having a substantially quadrilateral cross-section defining two substantially straight opposing lateral walls connected by a first wall and a second wall respectively along a first edge and a second edge of each said lateral wall;

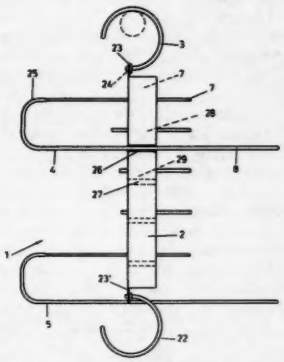
each said lateral wall comprising a substantially identical molded pyramid shaped recess extending toward each other, said pyramid having a base in the shape of a triangle substantially coplanar with its respective lateral wall, each said triangle having a base extending along said first edge and a vertex located on said second edge.

5,065,915

HINGED MULTIPLE GARMENT HANGER

Wilhelm Rösch, Hinzbecker Höhe 30, D-4300 Essen 15, Fed. Rep. of Germany

PCT No. PCT/DE88/00420, § 371 Date Jun. 13, 1989, § 102(e) Date Jun. 13, 1989, PCT Pub. No. WO89/02714, PCT Pub. Date Apr. 6, 1989
PCT Filed Jul. 7, 1988, Ser. No. 360,886
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 8712870[U]
Int. Cl.[5] A47G *25/14, 25/44, 25/28*
U.S. Cl. 223—89 **18 Claims**



1. A garment hanger for the simultaneous hanging and storage of a plurality of articles of clothing, said garment hanger comprising:

a carrying element provided with at least two suspension hooks, said carrying element defining a first longitudinal axis;

first bar means;

means for connecting said first bar means pivotably and slidably to said carrying element;

said first bar means defining a second longitudinal axis;

said first longitudinal axis being generally transverse to said second longitudinal axis; and

said first bar means being pivotable about said second longitudinal axis.

5,065,916

GARMENT HANGER WITH MOLDED INTEGRAL CLIPS

Gerhard Fildan, Vienna, Austria, assignor to Fildan Accessories Corp., Englewood Cliffs, N.J.

Filed May 30, 1990, Ser. No. 530,909
Int. Cl.[5] A47G *25/48, 25/34, 25/14*
U.S. Cl. 223—91 **12 Claims**

1. A hanger for lingerie, the hanger comprising:

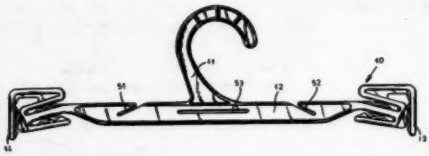
a horizontally straight bar having opposite ends;

a hook midway between the ends of said bar for suspending same; and

respective retaining heads formed unitarily on said bar at each of said ends, each of said retaining heads comprising a straight downwardly and outwardly inclined rectilinear support element extending from said bar at a downwardly open obtuse angle,

means at an end of said support remote from said bar defining a resilient formation having a crossbar formed with upwardly and downwardly extending parts,

an upper retaining element extending inwardly and upwardly from said upper part, parallel to said support element at the downwardly open obtuse angle to the bar, said support element and said upper retaining element being provided with juxtaposed parallel surfaces defining an upper channel and formed with spaced apart interdigitating arrays of teeth transversing said upper channel between said surfaces for receiving a garment strap, said



upper channel having a mouth lying above an upper edge of said bar and extending downwardly and outwardly from said mouth,

an outwardly extending leg formed on an inner end of said upper retaining element and substantially rigidly connected therewith, said leg extending generally parallel to said bar,

a foot extending downwardly from said leg and defining an upwardly extending channel with an outer surface of said formation whereby a waistband of a garment can be inserted between said formation and said foot,

a lower retaining element extending from said lower part and defining a lower channel with said support element open at a mouth above a lower edge of said bar and inclined downwardly and outwardly from said bar, and

means forming a ramp extending upwardly and outwardly and connecting said lower edge of said bar with said mouth of said lower channel.

5,065,917

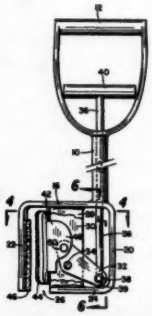
DEVICE FOR PULLING BOOTS ON WITH HANDLE AND CLAMP

Martin R. Diehm, Rte. 1, Box 99, Red Rock, Okla. 74651

Filed May 21, 1990, Ser. No. 526,026

Int. Cl.[5] A47G *25/80*

U.S. Cl. 223—113 **4 Claims**



4. A boot puller for pulling a boot onto the foot of a wearer comprising an elongated hollow tube having an upper fixed handle and a lower boot engaging portion, the boot engaging portion including a horizontal arm connected at one side end to a lower end of the tube, a pair of spaced vertical arms extending downwardly from the ends of the horizontal arm, the lower end of one vertical arm connecting with a narrow horizontal plate which extends toward the other vertical arm but terminates at a spaced distance therefrom to form an opening, a pair of spaced vertical plates extending upwardly from the sides of the horizontal plate and connecting at their upper ends with the horizontal arm to one side of the tube, a triangular plate pivotally mounted between the two vertical plates, a vertical rod extending downwardly from above the top of the vertical tube, through the tube, and to a lower end which is bent at right angles to the rod and which engages a hole in the triangular plate, the upper end of the rod being connected to the center of a short horizontal rod which constitutes a moveable handle, a clamp being mounted between the two vertial plates, the clamp having a concave vertical edge adjacent to the other vertical arm, a first strip of protective material attached to the concave edge of the clamp, the edge of the other vertical arm having a convex edge facing the concave edge of the clamp, a second strip of protective material attached to the convex edge of the other vertical arm, the protective strips being adjacent but spaced from each other, the clamp being provided with a pair of spaced ears which extend over the one end of the triangular plate, the ears pivotally connecting the clamp to the triangular plate, the arrangement of the pivotal connections and the hole in the plate being such that an upward lifting of the rod will cause the clamp to move towards the other vertical arm, whereby when the boot puller is slipped over the upper rear end of a boot such that the end of the boot is positioned between the clamp and the other vertical arm, the wearer can place his fingers beneath the moveable handle while the wearer's foot is inserted into the boot, the rod is urged upwardly while the triangular plate pivots so that the boot is gripped between the protective strips, and whereby continued lifting against the moveable handle will cause the boot to slip onto the foot of the wearer.

5,065,918

FILM CASE HOLDER FOR POCKET CAMERA

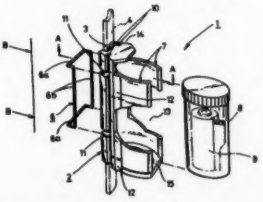
Byoung E. Chun, 310-504, Chooggong APT Banpo-dong, Seocho-gu; Nam H. Chun, 177-12, Koosan-dong Eunpyoung-gu, and Woo S. Chun, 832-17, Dongmoon-dong Susan-si, Chungcheongnam-do, all of Seoul, Rep. of Korea

Filed Mar. 1, 1990, Ser. No. 487,000

Claims priority, application Rep. of Korea, May 24, 1989, 89-6796[U]

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—191 **3 Claims**



1. A film case holder for a pocket camera for releasably attaching to a hand strap, wherein the film case holder comprises:

a holder body extending longitudinally to the hand strap, having a recess on the rear surface thereof for receiving the hand strap;

a fastener adapted to engage with and securely attach the holder body to the hand strap;

said holder body formed with a resilient support member

having a C-shaped cross section for receiving a film case; and

wherein said holder body is provided with a pair of side grooves on the side surface and a pair of transverse grooves for receiving said fastener, respectively.

5,065,919

SLING SUPPORT APPARATUS

George W. Sims, 104 Greenview Dr., Lawrenceburg, Ky. 40342

Filed Nov. 29, 1990, Ser. No. 619,392

Int. Cl.[5] A45F *3/14*

U.S. Cl. 224—257 **6 Claims**

1. A sling support apparatus including an elongate continuous flexible cord loop, with the cord loop for permitting repositioning of the pulley means relative to the cord loop, and

the pulley means including a pulley mounted upon the cord loop, and

the pulley means further including a fastener member mounted to the pulley means, the fastener member mounted to a fastener boss selectively removable from the fastener member, and

the fastener boss including a first support cord, the first support cord integrally and medially mounted of its length relative to the fastener boss, and

the first support cord including a first and second free terminal end, with the first and second free terminal ends including a respective first and second ring member mounted to the respective first and second free terminal end, and

the first and second ring members arranged for securement to respective binocular loops, the binocular loops mounted to an associated binocular member.

5,065,920

STOWAGE TRAY

John A. Amner, Rochford, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 290,121, Dec. 27, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 506,586

Claims priority, application United Kingdom, Jan. 22, 1988, 8801426

Int. Cl.[5] B60R *7/00*

U.S. Cl. 224—275 **7 Claims**

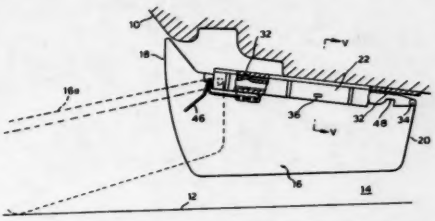
1. An underseat stowage tray arrangement for a seat of a motor vehicle, the arrangement comprising:

a seat base positioned on the underside of the seat;

a pair of spaced, longitudinally extending rails fixedly secured to the seat base;

a tray slidably received by the rails for movement with respect to the seat between a rearward closed position and an extreme forward position;

means operatively disposed between the tray and the rails to permit tipping movement of the front of the tray upon movement to the extreme forward position; and



a spring secured to at least one of the rails and engaging portions of the tray slidable received in the at least one rail, the spring being manually operable to permit the tray to be disengaged from the rails.

5,065,921

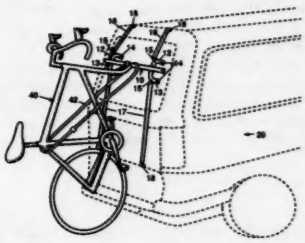
BICYCLE RACK FOR MOUNTING ON A VAN

Mark H. Mobley, P.O. Box 636, Norris, Tenn. 37828

Filed Nov. 14, 1989, Ser. No. 436,492

Int. Cl.[5] B60R *9/00*

U.S. Cl. 224—324 **3 Claims**



1. A rack assembly for mounting at least one bicycle on a vehicle with a substantially vertical rear exterior wall, a rear bumper and having a width, said rack assembly comprising:

(a) an elongated bar having first and second ends and sized to extend substantially the width of the vehicle;

(b) two pair of support legs attached to the elongated bar at points spaced away from said first and second ends, each pair of support legs forming a generally c-shaped structure when the rack assembly is viewed from its side; said elongated bar and two pairs of support legs forming an elongated structure;

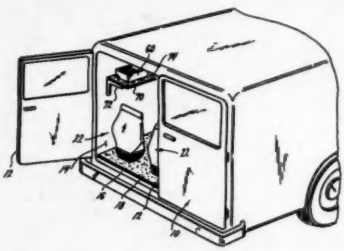
(c) means for adjustably attaching the elongated structure to said rear exterior wall; and

(d) a plurality of quick release clamping mechanisms mechanisms being positioned between one of the first and second ends of the elongated bar and one pair of support legs; said rack assembly having only a single elongated bar and structured such that the rack assembly is capable of being positioned on the vehicle to allow the bicycle fork to engage the quick release clamping mechanism and a rear tire of the bicycle to engage the rear bumper of the vehicle.

5,065,922
CONTAINER HOLDING SYSTEM

Charles C. Harris, 1611 Manufacturers Dr., St. Louis, Mo. 63026

Filed Feb. 28, 1990, Ser. No. 486,118
Int. Cl.[5] B60R *7/02*; B65D *85/50*
U.S. Cl. 224—42.32 6 Claims



1. A system for holding a container in place in a moving vehicle comprising:

(a) a vehicle having a generally horizontal, flat floor area,

(b) a floor covering having a relatively large area upper surface corresponding to a loop component of a hook and loop fastener means and covering a substantial portion of said floor area,

(c) a first container having a bottom having an area substantially smaller than the relatively large area of the floor covering upper surface and tapered sidewall portions, said bottom having spaced apart portions,

(d) hook component portions of a hook and loop fastener means fixedly attached to the first container bottom spaced apart portions and cooperating with the upper surface of the floor covering to hold the first container selectively in place on the floor area in response to forces resulting from motion of the vehicle,

(e) a second, article-holding container having a bottom and compatibly tapered sidewall portions for interfitting said first container in nested relation, and

(f) a sleeve for said second container having a lower portion and an upper portion, said lower portion overfitting said second container side portions and being received in sandwich relation between said first and second containers, and said upper portion providing an article protecting cover.

5,065,923
FOOD SUPPORTING ELEMENT FOR ATTACHMENT TO A FOOD CONTAINER

Richard Hoefer, and Clovia Hoefer, both of 249 Stillwater La., Billings, Mont. 59105

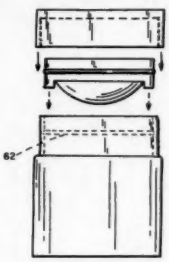
Filed Aug. 14, 1990, Ser. No. 567,092
Int. Cl.[5] G01F *11/26*
U.S. Cl. 220—694 1 Claim

1. A food-supporting element for attachment to a food container comprising:

A) a support rim means which includes means for mounting said support rim means on the food container adjacent to a mouth of that food container to be located inside the food container, said support rim means being U-shaped and including two legs attached to a bight section, said support rim further including a seal seating groove defined in one leg of said support rim legs and an O-ring located in said seating groove, said one leg being located adjacent to said container mouth and the other leg of said two legs being spaced from said container mouth when said support rim means is mounted on said container;

B) a food support bowl attached to said support rim means and spanning the food container mouth when the support rim means is mounted on the food container, said food support bowl being impervious to food container in the container and having a concave surface and a convex surface, with said concave surface being located adjacent to a rim of the container, said container rim circumscribing the mouth of the container;

C) bowl attaching means attaching said bowl to said support rim means, said bowl attaching means including a plurality of spaced-apart arms connecting said food support bowl to said support rim means, said spaced apart arms forming gap-defining means defining a plurality of gaps between said support rim means and said bowl so food contained in



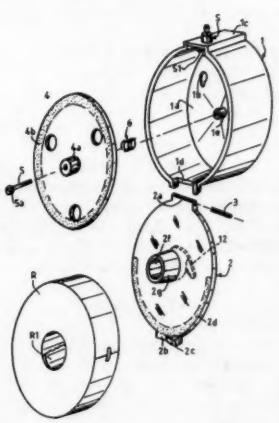
the container can flow through said plurality of gaps to move onto said bowl concave surface to be supported on said concave surface adjacent to the container mouth; and

D) a seal seating groove defined on the container adjacent to the container mouth to be aligned with said support rim seal seating groove when said support rim means is mounted on the container, said O-ring being accommodated in said container seal seating groove and in said support rim seal seating groove and preventing food seapage between said support rim means and said container.

5,065,924
PAPER TOWEL DISPENSER WITH CENTRAL UNWINDING

Maurice Granger, 17 Rue Marcel Pagnol, 42270 Saint Priest en Jarez, France

Filed Dec. 6, 1990, Ser. No. 623,217
Claims priority, application France, Nov. 6, 1990, 90 14094
Int. Cl.[5] B26F *3/02*
U.S. Cl. 225—46 15 Claims



1. An apparatus for dispensing a static roll of paper, wherein said roll is unwound from a central axis to an outer periphery thereof, said apparatus comprising:

a hollow cylindrical casing for housing said roll such that a

central axis of said casing and the axis of said roll are oriented horizontally, said casing comprising:

(i) a back wall having means for attachment to a support surface; and

(ii) a front wall having an opening formed therein which is aligned with the axis of said roll, said opening enabling passage through said front wall of a helical strip of paper unwound from said roll;

means for applying constant pressure to substantially an entire end surface of said roll such that said roll is retained in said casing without deformation or collapse; and

means associated with said opening for cutting said strip into segments.

5,065,925

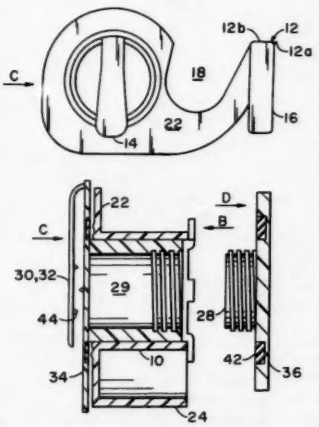
TAPE DISPENSING DEVICES

Carlene Ridenour, P.O. Box 1, Edmon, Pa. 15630

Continuation-in-part of Ser. No. 290,369, Dec. 29, 1988, abandoned. This application Mar. 1, 1990, Ser. No. 487,404

Int. Cl.[5] B26F *3/02*; B65D *85/672*

U.S. Cl. 225—78 **7 Claims**



1. A device for the dispensing of tape, comprising a spindle means for carrying a roll of tape, a cutter means for serving tape pulled from the roll, and a clip means for clipping the spindle means and cutter means to an article of clothing, the spindle means comprising a core means for supporting a sleeve and a sleeve supported on the core means for carrying a roll of tape, the sleeve being connected to the cutter means by a panel means for connecting, the sleeve and cutter means extending laterally from the panel means, the clip means being attached to the core means, and rotation preventing means for preventing rotation of the sleeve on the core means, the rotation preventing means comprising plates on ends of the core means, the clip means lying on one side of a first of said plates, the core means extending laterally from the other side of the first plate to a second of said plates.

5,065,926

TELESCOPIC TOOL FOR STRIPPING WASTE WITHIN A SHEET PROCESSING MACHINE

Marcel Yerly, Jouxtens, Switzerland, assignor to Bobst SA, Switzerland

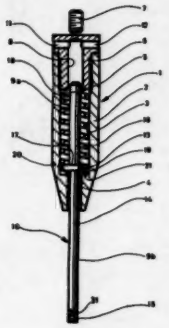
Filed Apr. 6, 1990, Ser. No. 505,508

Claims priority, application Switzerland, Apr. 7, 1989, 01313/89

Int. Cl.[5] B26F *3/02*; B31B *49/00*

U.S. Cl. 225—93 **10 Claims**

1. In a telescopic toll for stripping waste within a sheet processing machine, said tool comprising a hollow cylindrical body having a first bore, a second bore extending axially from the first bore and coacting therewith to form an internal shoulder, said first bore receiving a cap to close the first bore, said cap having a third bore axially aligned with the first and second bores, a pin having a first portion and a second portion separated by a collar being disposed with the second portion and collar received in the first bore and the second portion extending in the second bore and out of the tool and biasing



means comprising a spring between the collar and the end of the cap to urge the collar toward the internal shoulder, the improvements comprising the second portion being formed of a first element and a second element connected to one another with the second element forming tip for the tool, said second and first elements being of different materials with the material of the second element forming means for absorbing shocks and misalignment and said tool having means for absorbing noise being disposed between the collar and the internal shoulder.

5,065,927

APPARATUS FOR EVENLY DISPENSING MELTED BUTTER

Seymour Wahl, 67 Prospect Ave., Hewlett, N.Y. 11557, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Mar. 27, 1989, Ser. No. 328,903

Int. Cl.[5] B65B *1/04*

U.S. Cl. 222—185 **2 Claims**

1. An apparatus for dispensing melted butter into a container of popcorn which comprises:

(a) a base adapted to be rested on a supporting surface;

(b) a receptacle associated with said base for holding melted butter therein;

(c) a cover fitting over said receptacle;

(d) a spout extending laterally from said receptacle;

(e) an elongated hollow perforated tube extending from said spout, said tube having a tip so as to go through the popcorn in the container;

(f) means for releasing the melted butter so as to be ejected evenly throughout the popcorn from said perforated tube; wherein said releasing means is a pressure controlled check valve that includes;

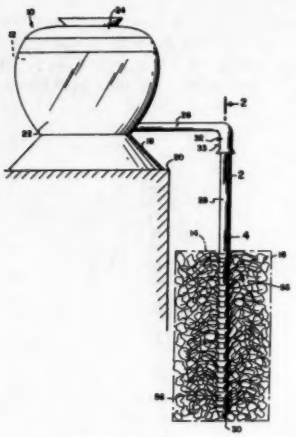
(g) a seat formed within an end of said spout;

(h) a poppet having a socket and carried within said valve;

(i) a spring held within said spout to hold said poppet against said seat; and

(j) a ball member on a distal end of said tube engagable with

said socket in said poppet, said ball member sized to allow the melted butter to pass therethrough when said tube is



pressed upwardly by the container up against tip of said tube, thereby raising said poppet from said seat.

5,065,928

METHOD AND APPARATUS FOR BLOWING AN OPTICAL FIBRE MEMBER

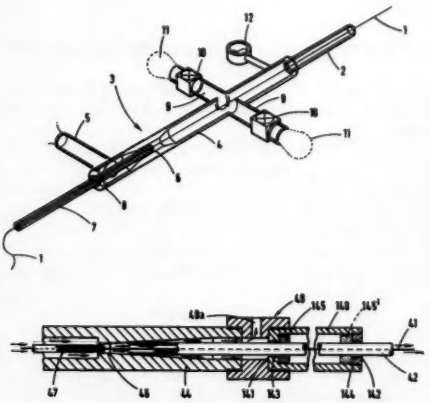
Rodney J. Davey, Rainhill; Graham R. Handley, Upton, and Alfred J. Ward-Smith, Bracknell, all of England, assignors to BICC plc., London and Corning Limited, Sunderland, both of, England

Filed Nov. 22, 1988, Ser. No. 274,752

Claims priority, application United Kingdom, Nov. 25, 1987, 8727580

Int. Cl.[5] B65H *54/78*

U.S. Cl. 226—7 **27 Claims**



1. A method of providing an optical communications route by introducing at least one optical fibre member into a tubular passageway, which comprises passing a current of fluid into and through a venturi having at least a throat portion and a divergent portion connected thereto, the downstream side of said venturi communicating with said tubular passageway, introducing the optical fibre member into the venturi and thence into said tubular passageway, and wherein part of the fluid enters the tubular passageway and passes therealong to transport the optical fibre member, and the remainder of said fluid is vented downstream of said venturi and does not enter the tubular passageway.

6. An apparatus for introducing at least one optical fibre member into a tubular passageway, which comprising means defining a venturi having at least a throat portion and a divergent portion connected thereto, the downstream side of said venturi communicating, in use, with the tubular passageway, means for passing a current of fluid into and through the venturi, means for introducing the optical fibre member into the venturi and thence into the tubular passageway, and venting means positioned downstream of said venturi and upstream of the tubular passageway for venting a portion of the fluid downstream of said venturi to prevent entry of said portion of said fluid into the tubular passageway.

5,065,929

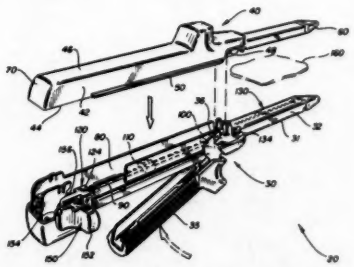
SURGICAL STAPLER WITH LOCKING MEANS

Dale R. Schulze, Lebanon; Jon A. Sherman, and W. Michael Mereness, both of Cincinnati, all of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed Apr. 1, 1991, Ser. No. 678,919

Int. Cl.[5] A61B *17/04*

U.S. Cl. 227—19 **3 Claims**



1. A surgical stapler divided longitudinally into first and second mated pieces and having a staple ejecting end and an opposite end, said stapler comprising:

a longitudinal inner passage;

a staple ejecting means slidably affixed to said first piece and adapted to move longitudinally within said passage toward the staple ejecting end to eject staples therefrom;

said staple ejecting means being integral with a gripping means projecting out of said first piece for gripping and moving said ejecting means within said passage;

said gripping means provided with a first locking means;

said second piece provided with a second locking means;

said first locking means adapted to engage said second locking means when said ejecting means is moved within said passage toward said ejecting end;

whereby when said staple ejecting means is moved toward said ejecting end to eject staples, said first locking means engages said second locking means and insures that said pieces are mated when staples are being ejected.

5,065,930

SPIRAL FEED FASTENER

George W. Kennedy, 111 N. Pompano Beach Blvd., Pompano Beach, Fla. 33062

Division of Ser. No. 428,070, Oct. 27, 1989, Pat. No. 4,981,246, which is a continuation-in-part of Ser. No. 153,768, Feb. 8, 1988, Pat. No. 4,867,367, which is a continuation-in-part of Ser. No. 882,345, Jul. 7, 1986, Pat. No. 4,728,021. This application Aug. 23, 1990, Ser. No. 571,936

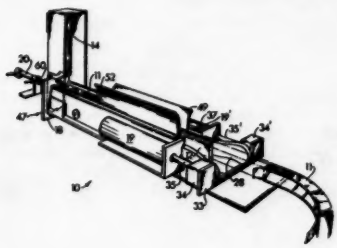
Int. Cl.[5] B25C *5/13, 5/16*

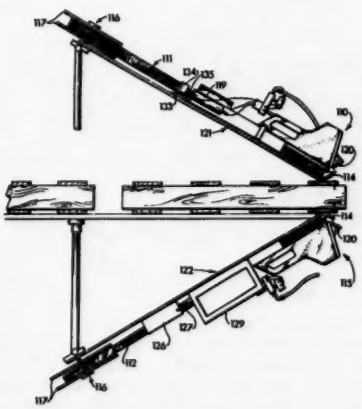
U.S. Cl. 227—130 **9 Claims**

1. A fastening machine of the type used to drive fasteners from an end of a strip of fasteners into a work product, the strip

of fasteners comprising fasteners connected to one another in an elongated supply of aligned, parallel abutting fasteners, the fastener machine including an elongated guide means having a discharge end, and an open end remote from said discharge end, a drive element at the discharge end of said guide means for driving the endmost fastener at the end of the strip from the strip of fasteners on said guide means, and fastener advancing means for maintaining the endmost fastener of the strip on said guide means at a position adjacent to said drive element, the improvement therein comprising,

said fastener advancing means being affixed to said fastening machine and being open at one end for longitudinally receiving on said guide means at said open end thereof a strip of fasteners and for discharging the fasteners at the other end of said guide means and including advancing means for engaging opposite sides of the fasteners on said guide means, and having power means for simultaneously





urging said advancing elements laterally toward each other into engagement within the machine with an intermediate portion of the strip of fasteners on said guide means and along the strip of fasteners parallel to the length of said guide means toward said drive element whereby an elongated strip of fasteners of a length greater than said guide means is progressively moved along its length by said fastener advancing means through the open end of the fastener advancing means toward the discharge end of said guide means as said drive element drives the endmost fastener of the strip at the end of said guide means into a work product, said power means including means for simultaneously urging said advancing elements laterally away from each other for disengaging said advancing elements from the strip of fasteners and moving them along said guide means toward said open end, and means for introducing the fasteners into said machine and said advancing means through said open end.

5,065,931

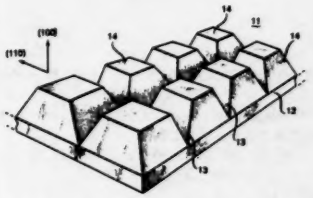
DEVICE FOR REMOVING SOLDER

Jay J. Liu, Somerville, and Y. H. Wong, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 255,896, Oct. 11, 1988, Pat. No. 4,923,521. This application Jan. 19, 1990, Ser. No. 467,457

Int. Cl.[5] B23K *1/018*

U.S. Cl. 228—19 **5 Claims**



1. A wick element for removing solder remnants from a substrate comprising: a monocrystalline element having on one surface thereof a pattern of grooves which define an array of mesa structures; the array of mesa structures and the grooves being covered by a thin metal coating.

5,065,932

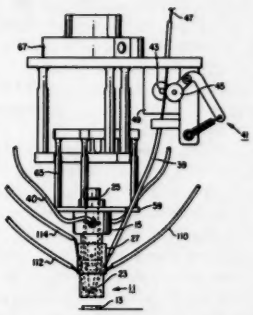
SOLDER PLACEMENT NOZZLE WITH INERT COVER GAS AND INERT GAS BLEED

Terry F. Hayden, Round Rock; Christopher A. Hicks, Austin, both of Tex.; Peter G. Ledermann, Ossining, N.Y.; Alvin D. Nguyne, Austin, Tex.; Stephen C. Steinbach, Austin, Tex., and Stanley K. Yu, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 24, 1990, Ser. No. 586,654

Int. Cl.[5] B23K *3/02*

U.S. Cl. 228—55 **7 Claims**



1. A nozzle assembly of the type which includes a heated metal tip of a soldering iron for depositing solder onto a series of conductive surfaces, the nozzle assembly comprising:

a nozzle mount supportable above the conductive surface to be soldered, the nozzle amount having a length and having an internal bore sized to receive the heated metal tip of a soldering iron;

a nozzle head formed of a non-conductive plastic material removably mounted on the nozzle mount, the nozzle head having a solder feed orifice and having an interior bore sized to receive a portion of the length of the nozzle mount, thereby allowing the heated metal tip of the soldering iron to extend at least partly within the interior bore of the nozzle head for contacting solid solder fed within the interior bore through the solder feed orifice, the interior bore of the nozzle head including a solder reservoir for molten solder, the reservoir terminating in a

tip opening for depositing molten solder onto a conductive surface; and

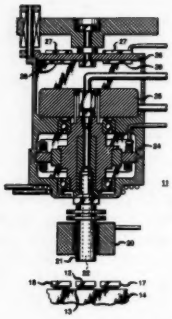
bleed gas means for supplying a bleed gas to the internal bore of the nozzle mount, past the heated metal tip of the soldering iron, and to the interior bore of the nozzle head to cool the nozzle assembly and exclude oxygen in the surrounding air form entering the nozzle assembly.

5,065,933

ELECTRONIC DEVICE MANIPULATING APPARATUS AND METHOD

Nagesh R. Basavanhally, Trenton, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 19, 1990, Ser. No. 584,831
Int. Cl.[5] B23K *1/018*
U.S. Cl. 228—102 **14 Claims**



1. A method for removing an element that has been soldered to the surface of a substrate comprising the steps of:

attaching a load cell to a vacuum pick-up tool, the load cell generating an electrical signal indicative of the mechanical stress of the tool against an object;

causing the pick-up tool to contact and to bear against the soldered element until the load cell generates a first signal indicative of a first level of stress;

in response to the first signal, heating the tool to a temperature sufficient to melt the solder bonding the element to the substrate, said melting resulting in a second level of stress on the tool which is smaller than the first level of stress, and further resulting in the load cell generating a second signal indicative of the second level of sress;

in response to the second signal, actuating the pick-up tool; and using the pick-up tool to move the element from the substrate.

5,065,934

METHOD OF MANUFACTURING ROD END JOINT

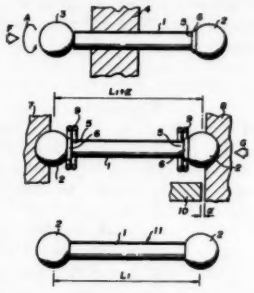
Kenichi Ito, Kani, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed May 14, 1990, Ser. No. 523,381
Claims priority, application Japan, May 16, 1989, 1-121886
Int. Cl.[5] B23K *20/12, 31/02;* B21D *53/84*
U.S. Cl. 228—112 **6 Claims**

1. A method of manufacturing a rod end joint comprising a rod and one or more ball sections formed at an end or ends of the rod, said method comprising steps of

rigidly fitting a ball or balls to the end or ends of the rod to form the ball section and

applying external compressive force longitudinally to a neck portion formed with the ball section while the neck portion is subjected to a high frequency annealing so as to plastically deform said rod.

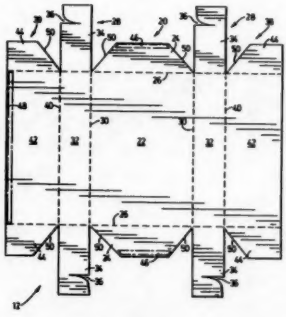


5,065,935

NO WRAP BOXES

James D. Mancel, Aurora, Canada, assignor to Shorewood Technologies, Inc., Dover, Del.

Continuation of Ser. No. 268,580, Nov. 8, 1988, abandoned. This application Jun. 14, 1990, Ser. No. 538,679
Int. Cl.[5] B65D *5/26*
U.S. Cl. 229—40 **24 Claims**



1. A box blank comprising:

a central panel having a center portion and opposed end flaps joined thereto along respective first crease lines;

opposed side panels joined to said central panel along respective second crease lines located perpendicularly to the first crease lines, each side panel having an inner portion and opposed end portions joined to the inner portion along extensions of said first crease lines, said end portions having means for interlocking engagement with a respective adjacent said end portion when the side panels are folded perpendicularly to the central panel;

opposed outer panels joined to the side panels along respective crease lines located parallel to the second crease lines, each outer panel having a mid-portion and opposed distal flaps joined to the said mid-portion along extensions of the first crease lines, the width of said outer panels combined being greater than the width of the central panel, and the width of said end flaps being equal to the width of said distal flaps;

wherein the box blank has peripheral edges and inner and outer surfaces, and further comprises a layer of wrapping paper located over said outer surface and wrapped around the peripheral edges of the box blank so as to conform to the shape thereof, the peripheral edges of the wrapping

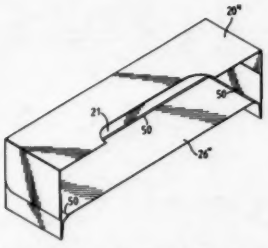
paper layer being adhered to the inner surface of the box blank.

5,065,936

COLLAPSIBLE BOX FOR TISSUES/PAPERS

Charles S. King, 19842 Edgwood La., Huntington Beach, Calif. 92646

Filed Jun. 1, 1989, Ser. No. 360,022
Int. Cl.[5] B65D *5/16*
U.S. Cl. 229—101 1 Claim



1. A variable size cardboard box having a top wall, a bottom wall, and four side walls, each wall having four edges, said top wall having an opening for accessing the interior, a continuous perforated line located in the side walls and extending around the entire perimeter of the box and spaced from the bottom wall,

three auxiliary perforated lines of equal length located at each of the four bottom corners of the box and extending along the edges of respective side walls and the bottom wall, all of said perforated lines providing means which facilitate pushing the bottom wall into the box to reduce its interior volume,

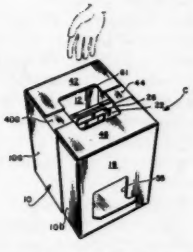
the bottom wall including a rectangular, auxiliary perforated line spaced a short distance form and parallel to, the edges of the bottom wall, the bottom wall further including four additional perforated lines which connect the corners of the bottom wall to the corners of the auxiliary line to facilitate forming a smaller bottom wall when it is inside the box.

5,065,937

CONTAINER WITH END WALL OPENING FOR HANDLE ACCESS

Karl M. Ritter, Carol Stream, Ill., assignor to Container Corporation of America, Clayton, Mo.

Filed Jan. 25, 1991, Ser. No. 645,704
Int. Cl.[5] B65D *5/10*
U.S. Cl. 229—117.13 8 Claims



1. A one-piece container having an internal divider panel, with an integral handle at one end thereof, and having an end wall with an opening affording access to said handle, said container being formed from a unitary blank of foldable paperboard, and comprising:

(a) pairs of opposed side walls foldably interconnected on parallel fold lines to form a tubular structure open at its upper and lower ends;

(b) an internal divider panel extending between and having opposite side edges foldably joined to the respective side walls of one of said pairs on fold lines that extend parallel to said last mentioned fold lines;

(c) said divider panel having foldably joined to an upper end edge thereof a handle panel adapted to be folded 180 degrees into overlapping relation with a portion of said divider panel to form therewith a two-ply handle with an upper extremity that does not, at any time, extend above any of said side walls;

(d) top and bottom end closure flaps foldably joined to upper and lower end edges, respectively, of said side walls and adapted to be folded inwardly 90 degrees and secured to each other in overlapping relation to form end walls for closing, at least partially, the ends of said structure;

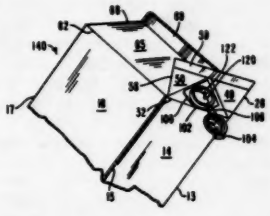
(e) certain of said top closure flaps being U-shaped and being arranged and disposed for cooperation with each other to form, when said top flaps are closed, a central opening large enough to accommodate the entry of a hand to enable one to reach into the container and grasp the handle and lift the container.

5,065,938

GABLE TOP CARTON WITH RESEALABLE POUR SPOUT

Nestor A. Anderson, Parsippany, N.J., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 11, 1989, Ser. No. 405,134
Int. Cl.[5] B65D *5/74*
U.S. Cl. 229—125.08 19 Claims



1. A gable top carton comprising:

a carton having a bottom wall, an upstanding side wall enclosure connected to and extending from the bottom wall, a pair of opposed triangular top walls hingedly connected to opposed portions of the side wall enclosure at locations thereon remote from the bottom wall, a pair of opposed generally rectangular top walls hingedly connected to opposed portions of the upstanding side wall enclosure at locations thereon remote from the bottom wall, triangular web panels connected to and extending between the respective triangular top panels and the rectangular top panels, said rectangular top panels and said triangular web panels being folded into generally overlying relationship to the triangular top panels, and being sealed to one another at portions thereof remote from the side wall enclosure, a first of said triangular top panels being provided with an aperture means therein for permitting material stored in said carton to be poured therefrom; and

a resealable pouring spout securely connected to the first triangular top panel in overlying relationship to the aperture means therein, said resealable pouring spout comprising a base having an opening extending therethrough, said base being affixed to the first triangular top panel such that the opening in the base is substantially in register with the

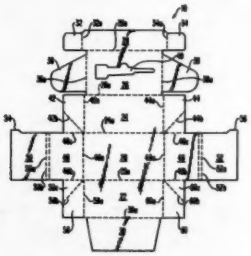
aperture means in the first triangular top panel, and a cover hingedly connected to the base and selectively engageable therewith for securely closing the opening in the base and the aperture means in the first triangular top panel, the cover of the resealable pouring spout includes a lift tap at a location thereon generally opposite the hinged connection of the cover to the base, said lift tab being disposed generally adjacent one of the hinged connections of the first triangular top panel to said triangular web panels.

5,065,939

SHARPS CONTAINER AND BLANK

Bobby L. Boothe, and Edward P. Godsey, both of Roanoke, Va., assignors to Chesapeake Packaging Company, Richmond, Va.

Filed Sep. 28, 1990, Ser. No. 589,959
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—151 **17 Claims**



1. A container for receiving and containing items to be disposed of, said container comprising a bottom panel, a front panel, a rear panel, two end panels, a top panel, and a front flap connected to said top panel, said front flap including flap tuck means adapted to be engaged with said two end panels for securing said top panel in a closed condition, wherein said flap tuck means comprises first and second flap tucks disposed on opposite sides of said front flap, said first and second flap tucks being inserted between respective ones of said two end panels and an interior of said container;

said front panel having first and second minor flaps connected to opposite ends of said front panel, said first and second minor flaps being folded and disposed between respective ones of said two end panels and the interior of said container; and

wherein at least a folded portion of each of said first and second minor flaps lies directly beneath said first and second flap tucks, respectively, so as to inhibit removal of said first and second flap tucks, whereby the container is resistant to be opened inadvertently.

5,065,940

TIE PLATE RAIL FASTENING SYSTEM

Albert Abramovich, 1155 41 St., 3 Flr., Brooklyn, N.Y. 11218

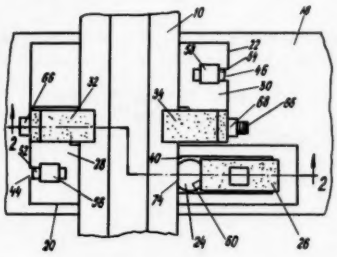
Filed May 3, 1991, Ser. No. 695,388
Int. Cl.[5] E01B *9/04*
U.S. Cl. 238—334 **5 Claims**

1. A rail fastener for supporting a rail having a foot on a support structure and maintaining the gage of a track comprising;

a rail plate consisting of two parts, each part having a planar upper surface for supporting the rail and an upwardly extending appendage, each appendage having an inclined surface for contact with a corresponding inclined surface on the foot of the rail whereby said parts are placed side by side with an appendage on opposite lateral sides of the rail, and means for tightening said parts to said rail;

a rigid stop mounted into the support structure which contacts the rail;

means for pulling said rail plate and said rail towards said rigid stop; and



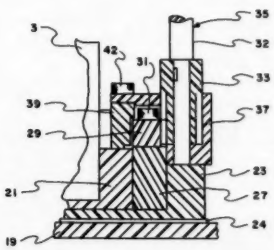
an opening in a part of said rail plate in which said rigid stop and said means for pulling are located.

5,065,941

APPARATUS FOR CARRYING OUT CONNECTION AND DISCONNECTION OF A CIRCUIT MEMBER TO AN ELECTRICAL CONNECTOR

Takao Suzuki; Atsuhito Noda; Mitsuo Komoto, and Shoji Umesato, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Ltd. and NEC Corporation, both of, Japan

Filed Jan. 19, 1990, Ser. No. 467,744
Claims priority, application Japan, Jan. 20, 1989, 1-4484[U]
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—264 **3 Claims**



1. An apparatus for carrying out a connection and disconnection of a circuit member to and from an electrical connector with said circuit member being moved in a first predetermined direction, said apparatus comprising:

an outer frame for holding said electrical connector;

an inner frame for defining a space for containing said circuit member, said inner frame being disposed inside said outer frame to be movable in said first predetermined direction with a gap left between said outer and said inner frames in said first predetermined direction;

a movable member disposed in said gap and movable in a second predetermined direction which is normal to said first predetermined direction, said movable member moving said inner frame in said first predetermined direction dependent on movement of said movable member in said second predetermined direction; and

driving means coupled to said outer frame and said movable member for driving said movable member is said second predetermined direction,

said driving means further comprising:

a rack member fixed to said movable member and having a plurality of teeth which are arranged in said second predetermined direction;

a pinion member having a central axis normal to said second predetermined direction and a peripheral portion around

said central axis, said peripheral portion being engaged with said teeth; and

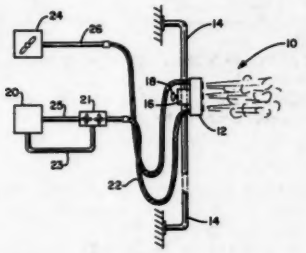
holding means coupled to said outer frame for holding said pinion member to said outer frame so that said pinion member is rotatable around said central axis.

5,065,942

SHOWER SPRAY SYSTEM

Timothy L. Shannon, 1901 Sackett Ave., Cuyahoga Falls, Ohio 44223

Filed Mar. 5, 1990, Ser. No. 487,927
Int. Cl.[5] B05B *7/08, 15/08*
U.S. Cl. 239—282 **12 Claims**



1. A shower spray system, comprising:

a source of air under pressure;

a source of water under pressure, said source comprising sources of hot and cold water;

a mixer valve interconnected with said sources of hot and cold water, mixing water therefrom to a desired temperature; and

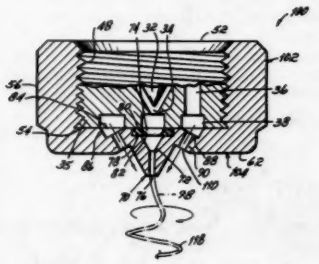
a shower head interconnecting said source of air and said mixer valve for emitting air and water therefrom, said shower head comprising a plurality of first and second nozzles, said first nozzles being interconnected with said source of air, and said second nozzles being interconnected with said source of water, said second nozzles comprising fan spray heads.

5,065,943

NOZZLE CAP FOR AN ADHESIVE DISPENSER

Bentley J. Boger, Atlanta, Ga., and Thomas C. Jenkins, Amherst, Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Sep. 6, 1990, Ser. No. 578,810
Int. Cl.[5] B05B *1/34;* B21P *1/02*
U.S. Cl. 239—298 **12 Claims**



8. A nozzle cap for use in an apparatus for dispensing hot melt adhesive which includes a gun body having a nozzle formed therein with an adhesive passageway for conveying heated hot melt adhesive, an air delivery passageway for conveying pressurized air, and an annular wall separating said adhesive passageway and said air delivery passageway, said nozzle comprising:

a one-piece nozzle mounting portion and nozzle plate portion, said nozzle mounting portion comprising a threaded nut adapted to mount to the nozzle of the gun body;

said nozzle plate portion being formed with a first surface on the inner side of said nozzle plate portion, a second surface on the outer side of said nozzle plate portion and a nozzle tip extending outwardly from said second surface;

said nozzle plate portion being formed with a central throughbore having an inlet at said first surface in communication with the adhesive passageway in the nozzle and an outlet at said nozzle tip;

said nozzle plate portion being formed with an annular recess surrounding said inlet to said throughbore;

an O-ring disposed in said recess substantially concentric with said inlet, said O-ring having a central opening communicating with said adhesive passageway in said nozzle and the outlet at said nozzle tip whereby heated hot melt adhesive flows from the adhesive passageway in the nozzle, through said O-ring and in contact with said O-ring, into said inlet of said central throughbore and is discharged from the outlet at said nozzle tip to form an adhesive bead;

said nozzle plate being formed with a plurality of bores surrounding said central throughbore and extending between said first and said second surfaces, said bores being in communication with said air delivery passageway in said nozzle, said bores being formed at an angle with respect to said central throughbore in said nozzle plate to direct pressurized air flowing therethrough into contact with the adhesive bead to form an elongated adhesive fiber for deposition on a substrate;

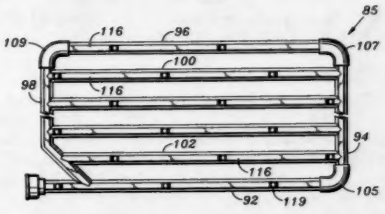
said O-ring being positioned to engage said annular wall to provide a seal between said adhesive passageway and said air delivery passageway.

5,065,944

REINFORCED SPRAY MANIFOLD

Mark D'Amato, Montreal, Canada, assignor to D.E.M. Controls of Canada, Montreal, Canada

Continuation-in-part of Ser. No. 385,354, Jul. 27, 1989, Pat. No. 5,000,388. This application Nov. 19, 1990, Ser. No. 615,178
Int. Cl.[5] B05B *1/14*
U.S. Cl. 239—550 **22 Claims**



1. A spray manifold for spraying liquid chemicals on planar workpieces such as printed circuit boards passing adjacent the manifold said manifold comprising:

a generally rectangular, tubular periphery;

a plurality of inner tubular members fluidly connected to said tubular periphery and extending therewithin, each of said inner tubular members having at least one longitudinally extending rib member formed thereon for providing greater structural rigidity to said manifold; and

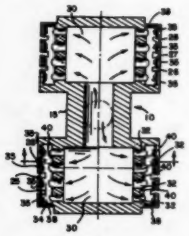
a plurality of spray nozzles mounted within the rib member of at least some of said inner tubular members, said spray nozzles being arrayed within the rib member to spray liquid chemicals upon the surface of the workpiece passing adjacent the manifold.

5,065,945

MULTIPLE HEAD SPRAY NOZZLE ASSEMBLY WITH COMMON SUPPLY MANIFOLD

Daniel A. Vidusek, St. Charles, and Justin D. White, Carol Stream, both of Ill., assignors to Spraying Systems Co., Wheaton, Ill.

Filed Apr. 3, 1990, Ser. No. 503,810
Int. Cl.[5] B05B 1/14
U.S. Cl. 239—556 19 Claims



1. A spray nozzle assembly for directing fluid in a substantially rectangular spray pattern comprising, in combination:

(a) a body portion having a manifold and at least one spray nozzle head;

(b) said body portion having means for permitting the coupling thereof to a fluid supply line;

(c) each of said nozzle heads having means defining a mixing chamber and means defining an internal flow passage for directing fluid from said manifold to the mixing chamber of each nozzle head; and

(d) means defining a plurality of elongated parallel discharge openings in each of said nozzle heads communicating with said mixing chamber, said discharge openings being arranged in closely spaced relation for discharging a spray pattern of generally rectangular shape with the fluid distribution substantially uniform throughout the pattern.

5,065,946

MEDIA AGITATING MILL AND METHOD FOR MILLING CERAMIC POWDER

Masamitsu Nishida, Osaka; Hamae Ando, Neyagawa, and Koichi Kugimiya, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 18, 1989, Ser. No. 381,369
Claims priority, application Japan, Jul. 21, 1988, 63-182337; Sep. 1, 1988, 63-219044; Oct. 4, 1988, 63-250209
Int. Cl.[5] B02C 19/12
U.S. Cl. 241—16 16 Claims

1. A method for milling a ceramic powder which comprises wet-milling at least one ceramic powder by a media agitating mill in the presence of a volume of liquid which is not more than 4 times the net-volume of the ceramic powder, adding a dispersing agent and carrying out milling by using grinding media not larger than 1 mm in diameter.

5,065,947

METHOD OF SHREDDING CARBON PAPER

Thomas L. Farnsworth, Hartville, Ohio, assignor to Invequest, Inc., North Canton, Ohio

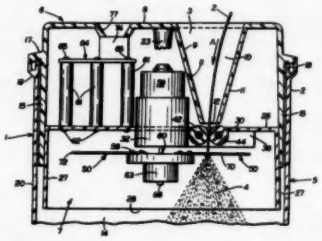
Division of Ser. No. 390,411, Aug. 7, 1989, Pat. No. 4,944,461. This application May 29, 1990, Ser. No. 530,114
Int. Cl.[5] B02C 19/00, 23/00
U.S. Cl. 241—30 6 Claims

1. A method of shredding carbon paper into indiscernible pieces including the steps of:

a) providing a thin cutting blade with a double beveled cutting edge;

b) rotating said cutting blade in a generally horizontal plane at a speed of generally within the range of 8,000 rpm and 12,000 rpm;

c) feeding a piece of carbon paper at a predetermined speed generally perpendicularly into the cutting path of said



rotating blade to cut said carbon paper into the indiscernible pieces; and

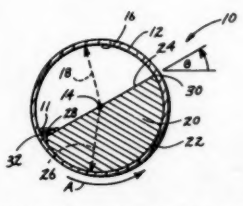
d) collecting the pieces of carbon paper in an enclosed container located beneath the cutting blade.

5,065,948

APPARATUS FOR PRODUCING THIN FLAKES

Lee R. Bunnell, Sr., Kennewick, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 275,071, Nov. 21, 1988. This application Oct. 18, 1990, Ser. No. 599,670
Int. Cl.[5] B02C 19/12
U.S. Cl. 241—199.5 8 Claims



1. An apparatus for shear grinding a platy solid material into thin flakes comprising:

a cylindrical shearing drum having a longitudinal axis and an internal surface formed about a first predetermined radius of curvature, the drum being supported for rotation about its longitudinal axis; and

a shear grinder received within the cylindrical shearing drum, the shear grinder having an external surface formed about a second predetermined radius of curvature, the second radius of curvature being slightly less than the first radius of curvature, the shear grinder being generally hemicylindrical, the external surface being defined by an arcuate surface and a generally non-arcuate surface, the arcuate surface having the second predetermined radius of curvature, the arcuate surface joining with the generally non-arcuate surface at first and second generally diametrically opposed locations.

5,065,949

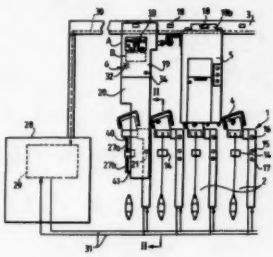
AUTOMATIC INSPECTING APPARATUS FOR YARN JOINING DEVICE

Shoichi Tone, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 2, 1989, Ser. No. 431,466
Claims priority, application Japan, Nov. 2, 1988, 63-142747[U]
Int. Cl.[5] B65H 54/20, 54/22, 63/00; G01L 5/04
U.S. Cl. 242—35.5 R 12 Claims

1. In an inspection apparatus which moves together with a

doffing carriage along a winder having a number of winding units arranged thereon, each winding unit being provided with a yarn joining device operable to join yarn and thereby provide a joint portion for each joining operation, the inspection apparatus having means for collecting sample yarns including a joint portion of yarns plural times within the doffing process to measure the strength of the joint in the winding unit, an automatic inspecting apparatus for a yarn joining device comprising:



judging means for judging, when more than predetermined times of measured results within said doffing process are recognized to be abnormal, as a defective spindle;

means for generating an abnormal signal when judged to be abnormal;

means for setting a yarn joining button of the winding unit to a yarn joining stop position in response to the abnormal signal; and

means for flickering a lamp associated with said winding unit in response to the abnormal signal.

5,065,950

TRAVERSE DRUM

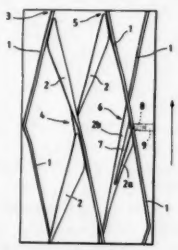
Hiroo Otoshima, Shiga, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Oct. 19, 1990, Ser. No. 600,322

Claims priority, application Japan, Oct. 25, 1989, 1-277648

Int. Cl.[5] B65H *54/48*

U.S. Cl. 242—43.2 **2 Claims**



1. A traverse drum comprising:

a first groove for guiding yarn across the traverse drum along a first traverse path,

a second groove for guiding yarn across the traverse drum along at least one additional traverse path,

a movable pin provided at a position defining a predetermined traverse length at an intersection of the first and second grooves, the pin being movable between at least first and second positions, wherein in the first position the movable pin crosses the first groove, and

a wall portion, formed in the second groove and extending from the position where the movable pin crosses the first groove so as to divide the second groove into two grooves.

5,065,951

THREAD TUBE

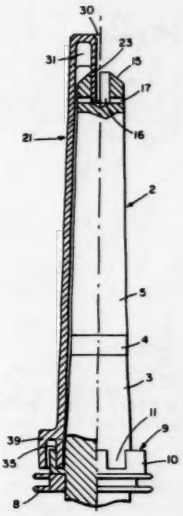
Rainer Busch, Effretikon, and Ludek Malina, Kloten, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Apr. 11, 1990, Ser. No. 507,964

Claims priority, application Switzerland, Apr. 14, 1989, 01412/89

Int. Cl.[5] B65H *49/34*

U.S. Cl. 242—46.21 **7 Claims**



1. Apparatus for winding a thread in a spinning machine having a spindle drivably rotatable at high speed comprising:

a thread receiving tube comprising a hollow tubular body coaxially receivable on the spindle;

the hollow tubular body including a stabilizing member at the top and bottom ends thereof and the spindle including means for receiving the stabilizing members at the top and bottom ends thereof;

the stabilizing members having axially outwardly facing surfaces for engaging a complementary axially inwardly facing surface of the receiving means, the surfaces axially opposing each other when the tube is received on the spindle;

wherein the receiving means comprises an axial aperture in the top of the spindle for receiving the top stabilizing member of the hollow tubular body, the top stabilizing member being rigid and resiliently deformable such that the axially outwardly facing surface of the top stabilizing member engages the complementary axially inwardly facing surface of the axial aperture with increasing engagement force upon increasing high speed rotation of the spindle; and,

wherein the receiving means comprises an upwardly projecting rim extending axially around the bottom of the spindle, for receiving the bottom stabilizing member of the hollow tubular body, the bottom stabilizing member being resiliently deformable such that the axially outwardly facing surface of the bottom stabilizing member engages the complimentary axially inwardly facing surface of the rim with increasing engagement force upon increasing high speed rotation of the spindle.

5,065,952

FILM CASSETTE WITH FILM EXPOSURE STATUS INDICATOR

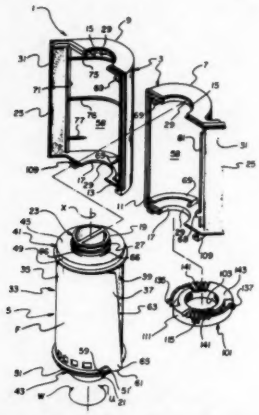
Dennis E. Baxter, East Rochester, and Jeffrey R. Stoneham, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1990, Ser. No. 529,285

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] G03B *17/26*

U.S. Cl. 242—71.1 **4 Claims**



3. A film cassette comprising a film spool supported inside a lighttight cassette shell for rotation to thrust a filmstrip coiled about said spool to the exterior of said shell, and a film exposure status indicator supported for rotation outside said shell from an unexposed position for providing a visible indication that said filmstrip is unexposed to an exposed position for providing a visible indication that the filmstrip is exposed, is characterized in that:

said shell includes a shroud substantially surrounding a circumferential edge of said status indicator to prevent one from manually grasping said edge in order to rotate the status indicator from its unexposed position to its exposed position, but leaving a top face of the status indicator substantially uncovered to allow access to the top face in order to rotate the status indicator from the unexposed position to the exposed position.

5,065,953

SAFETY BELT RETRACTOR

Johannes Schmid, Schwäbisch Gmünd-Hussenhofen, and Thomas Kielwein, Leinzell, both of Fed. Rep. of Germany, assignors to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 522,994

Claims priority, application European Pat. Off., Jun. 10, 1989, 89110507

Int. Cl.[5] B65H *75/28*

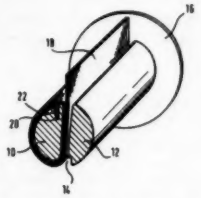
U.S. Cl. 242—74 **3 Claims**

1. In a safety belt retractor comprising a shaft for winding a safety belt webbing, said shaft having an axial slot through which an end portion of the belt webbing is led, and said slot separating the shaft into first and second stays having outer peripheries jointly defining the outer periphery of said shafts, the improvement wherein:

an axial groove is provided at the outer periphery of said first stay,

the end of the belt webbing is inserted into said axial groove, the portion of the belt webbing adjacent its end is wound at least twice around said first stay to have at least two windings thereon,

the remainder of the belt webbing is wound onto said shaft formed by said first and second stays, and



said outer periphery of said first stay has a diameter which is less than the diameter of the outer periphery of said second stay by an amount corresponding substantially to the thickness of said at least two windings of the belt webbing on said first stay.

5,065,954

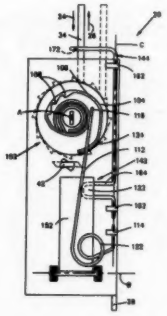
RELEASE MECHANISM

Patrick J. Cotter, Plymouth, Mich., assignor to TRW Vehicle Safety Systems Inc., Cleveland, Ohio

Filed Apr. 19, 1988, Ser. No. 183,651

Int. Cl.[5] A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.7 **9 Claims**



1. An apparatus comprising:

a spindle having a longitudinal central axis and rotatable in opposite directions about its longitudinal central axis;

means for securing an end portion of belt webbing to said spindle such that the belt webbing normally moves parallel to a predetermined plane as the belt webbing is withdrawn from said spindle and the belt webbing moves in a direction transverse to the predetermined plane during the last quarter of a revolution of said spindle as the belt webbing is fully withdrawn from the spindle;

means for biasing said spindle to rotate about its longitudinal central axis in a belt retraction direction to wind the belt webbing onto said spindle;

means for blocking rotation of said spindle in the belt retraction direction, said blocking means including a member which is movable between a first position in which rotation of said spindle in the belt retraction direction is blocked and a second position in which rotation of said spindle in the belt retraction direction is permitted; and

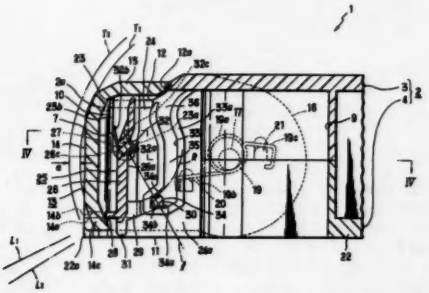
means for moving said member to its second position in response to the end portion of the belt webbing moving in the transverse direction relative to the predetermined plane during the last quarter of a revolution of said spindle as the belt is fully withdrawn from said spindle.

5,065,955

TAPE CASSETTE HAVING OUTER AND INNER LIDS LOCKED BY THE INNER LID

Hiroshi Fujii, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1990, Ser. No. 599,304
Claims priority, application Japan, Nov. 6, 1989, 1-289670
Int. Cl.[5] G11B *23/00*
U.S. Cl. 242—198 8 Claims



1. A tape cassette of the type in which a tape is withdrawn to the outside of a cassette casing such that a tape portion having front and rear sides, extends along a tape withdrawing area between tape exit portions formed at two end portions of a front wall of the cassette casing, and including a front lid rotatably attached to the cassette casing so as to cover the whole area of the front wall of the cassette casing, and a back lid rotatably attached to the front lid so as to substantially cover the rear side of the tape portion, the front and back lids being mounted in the cassette for movement between an open position allowing access to the tape portion when the cassette is in use, and a closed position wherein the front and rear sides of the tape portion are substantially covered by the front and back lids when the tape cassette is not in use, the tape cassette being characterized by:

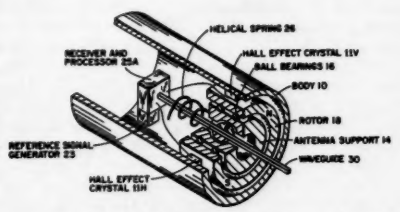
locking means for locking the back lid in the closed position when the tape cassette is not in use, the locking means comprising at least one guide pin mounted on the back lid and a corresponding guide groove in the cassette casing for receiving the guide pin, a lower end of the guide groove including a locking surface against which the guide pin is locked when the front and back lids are in the closed position.

5,065,956

METHOD FOR DETECTING CHANGES IN SPIN RATE OF A MISSILE IN FLIGHT

Jean A. Fattal, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Aug. 3, 1989, Ser. No. 389,475
Int. Cl.[5] F14G *7/00*
U.S. Cl. 244—3.2 9 Claims



1. A method for minimizing changes in the rotational speed of a body of a missile comprising the steps of:

(a) deriving a first signal indicative of actual angular velocity of the body of the missile and providing a second signal having an invariant period;

(b) applying the first and the second signal to a phase detector to derive a third signal indicative of any difference in timing between the first and the second signal;

(c) converting the third signal to a fourth signal indicative of the difference between the actual rotational speed of the body and a nominal speed represented by the second signal; and

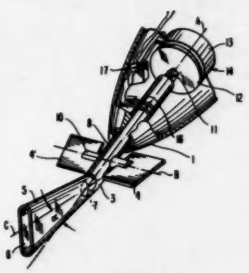
(d) providing, in response to the fourth signal, a signal indicative of the direction and the magnitude of change required in the rotational speed of the body of the missile.

5,065,957

DEVICE FOR CONTROLLING AERODYNAMIC BODIES

Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 16,881, Feb. 20, 1987, Pat. No. 4,927,096. This application Apr. 30, 1990, Ser. No. 516,516
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606423
Int. Cl.[5] F42B *13/28*
U.S. Cl. 244—3.21 18 Claims



1. A device for controlling an aerodynamic body having a searching head, a sensor for scanning a first predetermined scanning area, a setting member for exerting a transversal force on the aerodynamic body responsive to a signal from the sensor, and a setting device for adjusting the angular position of a rotor relative to the aerodynamic body, with the transversal force being used to place an acquired target in a second predetermined area relative to the first predetermined scanning area, with the sensor being disposed in a rotor coaxial with the longitudinal axis of the aerodynamic body and being driven in a rotating mode, and with the rotor including the setting member for exerting the transversal force on the aerodynamic body in a plane containing the sensor axis and the longitudinal axis of the aerodynamic body if the sensor senses the target in the first predetermined area.

5,065,958

HELICOPTER SOFT SNOW LANDING AID

John M. Stubstad, Dunwoody, Ga., and John H. Rand, Hanover, N.H., assignors to The United States of America as represented by the Secretary of the Army, Fort Belvoir, Va.

Filed Sep. 2, 1986, Ser. No. 902,712
Int. Cl.[5] B64C *25/66*
U.S. Cl. 244—17.17 27 Claims

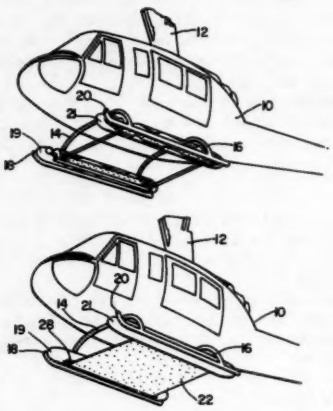
17. A helicopter landing aid, comprising:

a. a flexible membrane;

b. support means, located below the helicopter fuselage, for said membrane, one portion of said membrane being fixed with respect to said support means; and

c. means for pulling an unfixed portion of said flexible membrane to extend the membrane from a retracted position to

a deployed position in which said membrane is substantially planer, when landing on snow said membrane, in its



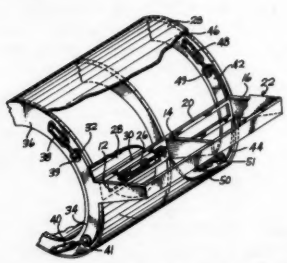
deployed position, provides a load bearing surface for said helicopter.

5,065,959

VIBRATION DAMPING AIRCRAFT ENGINE ATTACHMENT

Kumar G. Bhatia, Mercer Island; Walter E. Backus, Kent, and Jack S. Hagelin, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 21, 1989, Ser. No. 439,318
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 **11 Claims**



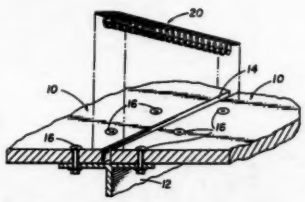
1. Means ror mounting an engine to the airframe of an aircraft which means are particularly adapted to reduce the dynamic response of the airframe due to engine vibration, said means comprising at least two struts, said struts comprising at least two spars and a closure rib extending therebetween, said struts extending between said engine and the airframe of said aircraft, and one or more dampers connecting said spars and airframe, and a damper connecting said closure rib and said airframe, said means being particularly adapted to damp vibration in all directions and reduce the dynamic response of the airframe to engine vibration.

5,065,960

GAP FILLER FOR ADVANCED AIRCRAFT TO REDUCE RADAR DETECTABILITY

Nicholas T. Castellucci, San Pedro, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Feb. 5, 1990, Ser. No. 474,977
Int. Cl.[5] B64C *1/06*
U.S. Cl. 244—131 **15 Claims**



1. A gap filler positionable in and across a gap formed between adjacent side edges of adjacent aircraft panels, the gap filler including a horizontal portion extending across the gap and a vertical portion extending therefrom into the gap, the vertical portion having edges in frictional contact with the side walls of the gap to resist removal of the gap filler from the gap, the gap filler being formed of an electrically conductive material selected to preclude galvanic corrosion when in contact with the panels and to abate electrical discontinuities at the gaps between the panels, thereby reducing aircraft detecability by radar and improving lighting strike tolerance.

5,065,961

ORDNANCE EJECTOR SYSTEM FOR AN AIRCRAFT

Larry G. Ellis, Provo, Utah, and William R. Carter, Dayton, Ohio, assignors to Teleflex Incorporated, Limerick, Pa.

Filed Feb. 19, 1991, Ser. No. 657,520
Int. Cl.[5] B64D *1/12*
U.S. Cl. 244—137.4 **15 Claims**

1. An ordnance ejector apparatus (10) for ejecting an ordnance (16) for an aircraft (14) comprising: a support frame (18) extending between a forward end (20) and a rearward end (22) for fixed attachment to an aircraft (14); a rail (24) extending between a forward end (26) and a rearward end (28) for releaseably retaining an ordnance (16) thereto; forward link means (34) pivotally connected to said forward end (20) of said support frame (18) and said forward end (26) of said rail (24) for displacing said forward end (26) of said rail (24) from said forward end (20) of said support frame (18) a predetermined distance; rearward link means (48) pivotally connecting said rearward end (22) of said support frame (18) and said rearward end (28) of said rail (24) for displacing said rearward end (28) of said rail (24) from said rearward end (22) of said support frame (18) a predetermined distance; forward actuator means (76) having an output stroke along a linear path for controlling the pivotal movement of said forward link means (34); rearward actuator means (86) having an output stroke along a linear path for controlling the pivotal movement of said rearward link means (48); and characterized by said forward actuator means (76) and said rearward actuator means (86) being fixedly aligned in an axially oppositely extending disposition such that the linear output stroke of said forward actuator

means (76) acts along a colinear and opposite direction from the linear output stroke of said rearward actuator means (86) to reduce reaction forces between said forward (76) and rearward (86) actuator means.

5,065,962

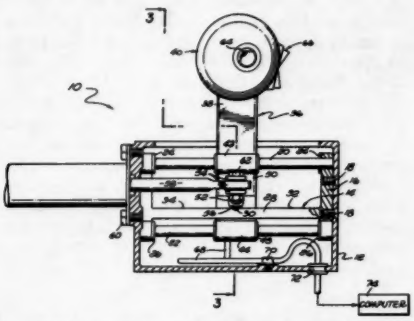
DIGITAL POWER CONTROLLER

William J. Adams, Torrance; Barbara G. Jex Courter, El Segundo; Craig S. Fong, Torrance; Robert C. Murray, Inglewood, and Paul A. Marshall, Burbank, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1989, Ser. No. 457,892

Int. Cl.[5] B64C *13/04, 19/00*

U.S. Cl. 244—234 10 Claims



6. A digital power controller for an aircraft having a computer controlled propulsion system and a center console of the type including a pedestal disposed in a central location between the pilot's knees, and below and aft the front instrument panel of the aircraft, said digital power controller comprising;

(a) a housing mounted within said pedestal;

(b) a movable handle attached to said housing and in electronic communication with a computer of said propulsion system, said handle being positionable in a neutral location for maintaining the aircraft at a substantially constant velocity and for resetting power command functions,

said handle being positionable in locations forward said neutral location for commanding increasing acceleration rates of said aircraft,

said handle being positionable in locations aft said neutral location for commanding increasing deceleration rates of said aircraft; and

(c) switching means associated with said movable handle, said switching means engagable at said forward and aft positions for commanding velocity hold and for permitting reposition of said handle to said neutral location for resetting power command functions.

5,065,963

TRANSPORTING TRAIN TRAVEL CONTROL SYSTEM

Junichi Usui, and Hideichi Tanizawa, both of Osaka, Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Filed Aug. 16, 1989, Ser. No. 394,762

Claims priority, application Japan, Sep. 1, 1988, 63-219907; Sep. 1, 1988, 63-219912; Jun. 12, 1989, 1-68396[U]

Int. Cl.[5] B61L *3/06, 3/12*

U.S. Cl. 246—187 B 3 Claims

1. A system to control travel of trains running along a travelling rail, which comprises

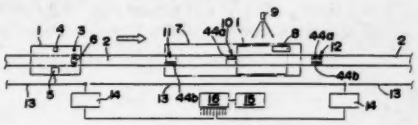
(a) a stop target provided at each stop position along said rail,

(b) a stop sensing device carried by said train for detecting said stop targets,

(c) control means for stopping the train in response to the sensing of a stop target, and

(d) override means for overriding said control means, to prevent stopping of the train upon detection of a stop target,

(e) said override means comprising an override sensor carried by said train and a controllable signal transmitter located at a stop position, said override sensor becoming activated before the detection of a stop target by said stop sensing device,



(f) said controllable signal transmitter and said override sensor having an effective transmission-receiving range which is greater in the direction of train travel than an effective range in said direction of said stop target and said stop sensor.

5,065,964

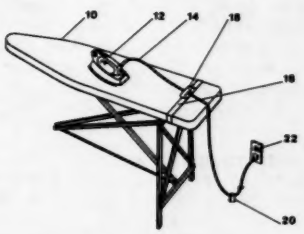
CORD CADDIE

Comer F. Polak, 6470 Seagull Dr. #307, Bradenton, Fla. 34210

Filed Nov. 27, 1990, Ser. No. 618,481

Int. Cl.[5] F16L *3/00*

U.S. Cl. 248—51 2 Claims



1. A retaining guide for an electric iron cord extending between an electric power outlet and an electric iron atop an ironing board having a top surface, a narrow end and a wider end, said retaining guide comprising:

a narrow flat elastic strap adapted to be stretched to encircle said wide end, said strap having an integral loop adapted to receive said electric cord to keep the cord on the top surface of the iron board, and

a weight attached to the electric cord between the strap and the electric outlet to maintain the cord relatively taut.

5,065,965

TRASH BAG HOLDER

R. Michael Aulabaugh, 1510 Seagull Dr., S. Pasadena, Fla. 33707

Filed Aug. 27, 1990, Ser. No. 573,441

Int. Cl.[5] B65B *67/00*

U.S. Cl. 248—99 2 Claims

1. A trash bag holder adapted to hold the bag open while trash is swept thereinto comprising:

(a) a flat, thin bottom panel having two linear edges and having an appropriate size to fit into the interior of said bag, said bottom panel having a flap extending from one end thereof adapted to extend outside said bag when said holder is positioned inside said bag, and thereby to facilitate the sweeping of trash into said bag;

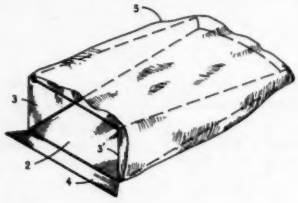
(b) first and second flat, thin side panels each also having a bottom linear edge and also adapted to fit into the interior

of said bag, said side panels each also having a top linear edge;

(c) a first hinging means joining one of said linear edges of said bottom panel to said bottom linear edge of said first side panel;

(d) a second hinging means joining the other of said linear edges of said bottom panel to said bottom linear edge of said second side panel;

said side panels each being adapted to open to an angle of approximately 90° with said bottom panel and thereby hold said bag open when positioned inside said bag, and



also adapted to be converted to a collapsed state by having said side flaps each turned to approximately 0° with said bottom panel; and

(e) a restraining means capable of restraining said first and second side panels from collapsing onto said bottom panel when said holder is positioned in a supporting position inside said bag, in which said restraining means is a rod having connecting means at each end thereof, one of which connecting means is hingedly affixed to said top edge of one of said side panels and the other of said connecting means is capable of being temporarily affixed to said top edge of said other side panel.

5,065,966

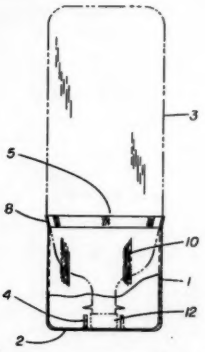
PORTABLE HOLDER TO SUPPORT A RECAPPED CONTAINER OF EFFERVESCENT LIQUID IN AN INVERTED POSITION TO RETAIN THE LIQUID'S FRESHNESS

Dennis V. Hartke, 4825 Mill Pond Loop, Auburn, Wash. 98002

Continuation of Ser. No. 277,360, Nov. 28, 1988, Pat. No. 4,960,254. This application Jan. 8, 1990, Ser. No. 461,683

Int. Cl.[5] A47G *23/02*

U.S. Cl. 248—146 **4 Claims**



1. A portable holder in combination with a previously opened, capped container of effervescent liquid partially emptied and recapped, said holder supporting said container in an inverted position, whereby, remaining effervescent liquid therein is forced into contact about the interior of the replaced cap causing the liquid to form a seal between the cap and container to prevent the escapement of gas from the container, said combination, comprising:

a surrounding hollow upright body, consisting of a base portion, and a peripheral flange which forms a vertical support means extending upwardly from the said base portion, forming a top opening receives an inverted container, and limits the lateral movement of said inverted container, wherein, the said vertical supports extend upwardly from the said base portion a distance at least equal to the farthest distance the inverted container must protrude through the said top opening to stabilize the container in the inverted position, wherein, the said vertical support means, in combination with the said base portion, form a drip basin for collecting any liquid that may seep past the replaced cap while storing the container in the inverted position, wherein, said surrounding hollow upright body (A portable holder as claimed in claim **13**, wherein said base portion of said portable holder) has a positioning aperture therein, (wherein, the said positioning aperture, in said base portion, is) comprised of an annular flange extending from the said base portion a distance at least equal to a distance required for the cap end of said container to be received into the said annular flange, said annular flange being spaced inwardly on said base from said peripheral flange, said annular flange forms a means for limiting the lateral movement of the cap end of said inverted container, wherein, the said positioning aperture, in combination with said vertical support means, assists in maintaining the containers substantially vertical position.

5,065,967

SEAT DEVICE FOR VERY SMALL SIZE SHOVEL CAR

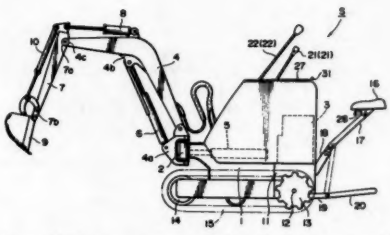
Yoshiaki Murakami, and Seiji Nishihara, both of Ehime, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 6, 1990, Ser. No. 549,116

Claims priority, application Japan, Jul. 13, 1989, 1-180824

Int. Cl.[5] F16M *11/00*

U.S. Cl. 248—161 **10 Claims**



1. A seat device on a very small size shovel car comprising:

a car body;

an operating boom mounted for pivotal motion on a front portion of the car body;

an engine and a transmission case mounted on a rear portion of said car body;

a support element mounted at a rear lower portion of said car body;

a support post having a seat secured to the top end thereof, said support post being mounted on said support element for motion between an operative position in which said support post is directed upwardly and rearwardly and a seat face of said seat is directed upwardly to allow an operator to be seated thereon, and an inoperative position in which said support post extends vertically upwardly along said car body of said shovel car and said seat face of said seat is directed rearwardly; and

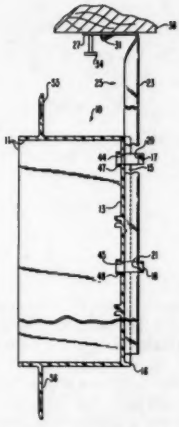
securing means for securing said support post at the operative and inoperative positions.

5,065,968

ELECTRICAL BOX MOUNTING APPARATUS

Gregory J. Kesler, and Kenneth R. Schnell, both of South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Oct. 25, 1990, Ser. No. 603,224
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—205.1 6 Claims



1. An apparatus for mounting an electrical box in a building wall or the like, the box being of the type having side walls, a back wall and an open front, the apparatus comprising the combination of

a generally L-shaped hanger having an end adapted to be attached to a structural member in the building wall and an elongated leg of substantially uniform cross section;

means on the back wall of said box defining first and second openings dimensioned to receive said elongated leg therethrough, said openings being aligned with each other along an axis generally parallel with said back wall;

means defining a channel recessed into said back wall and extending generally parallel with said axis, said channel having an open end for receiving said elongated leg and a closed end limiting insertion of said elongated leg into said channel, said means defining said openings being spaced along said channel, and

means on said box along said channel for frictionally engaging said elongated leg extending through said openings.

5,065,969

APPARATUS FOR MOUNTING AN ANTENNA FOR ROTATION ON A MAST

John A. B. McLean, Fergus, Canada, assignor to Bea-Bar Enterprises Ltd., Fergus, Canada

Filed Jun. 9, 1989, Ser. No. 349,484
Int. Cl.[5] E04G *3/00*
U.S. Cl. 248—282 11 Claims

1. Apparatus for mounting an antenna on a vertical mast for rotation of the antenna around the mast, wherein:

the apparatus includes a rotatable component and a non-rotatable component, and a means for supporting and guiding the rotatable component for rotation relative to the non-rotatable component;

the rotatable component includes a means for attaching the antenna thereto;

the non-rotatable component includes a means for clamping and locking the non-rotatable component around, and to, the mast;

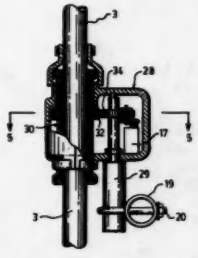
the rotatable component and the non-rotatable component are each so constructed and arranged that each may be assembled to the mast radially with respect to the mast, at an intermediate point along the length of the mast, away from, and without access to, the ends of the mast;

the apparatus includes a gear wheel, and another gear which is in operative meshing engagement with the gear wheel;

the gear wheel and the said other gear are operatively associated one with the rotatable component, and the other with the non-rotatable component;

the apparatus includes an operable drive means which is effective, when operated, to drive the gear wheel and the other gear in relative rotation, and thereby to rotate the rotatable component;

the gear wheel has gear teeth which are arranged in a circular arc, and the arrangement of the apparatus is such that, when the apparatus is assembled to the mast, the axis of the said arc is vertical and lies within the cross-section of the mast;



the gear wheel is in two separable portions, which are so adapted and arranged that the portions may be assembled to the mast radially with respect to the mast, and may be joined together around the mast, at an intermediate point along the length of the mast, away from, and without access to, the ends of the mast;

the non-rotatable component is in two separable portions, which are so adapted and arranged that the portions may be assembled to the mast radially with respect to the mast, and may be joined together around the mast, at an intermediate point along the length of the mast, away from, and without access to, the ends of the mast;

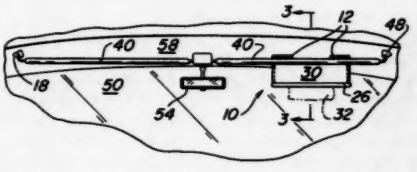
and the rotatable component is in two separable portions, which are so adapted and arranged that the portions may be assembled to the mast radially with respect to the mast, and may be joined together around the mast, at an intermediate point along the length of the mast, away from, and without access to, the ends of the mast.

5,065,970

BRACKET TO SUPPORT A TISSUE BOX ON A SUN VISOR

Shelly Gross, The Fairmont, Apt. 504, Bala Cynwyd, Pa. 19004

Filed Jan. 4, 1991, Ser. No. 637,402
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—311.2 5 Claims



1. A tissue box holder to be frictionally mounted on the sun visor of a vehicle to hold a tissue box having a plurality of tissues therein, the sun visor having a top and bottom surface,

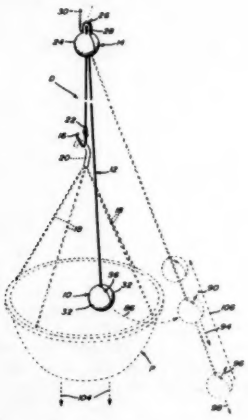
the tissue box holder being formed of a generally rigid material and comprising a bracket having a generally U-shaped configuration, the bracket comprising a top panel, a rear panel generally perpendicular to the top panel, and a bottom panel extending generally parallel to the top panel and integral with and generally perpendicular to the rear panel and having an opening therein for dispensing the plurality of tissues, wherein the bracket is dimensioned so that when the top panel of the bracket is adjacent the top surface of the sun visor, the distance between the bottom surface of the sun visor and the bottom panel permits the frictional insertion of the tissue box therebetween.

5,065,971

HEIGHT ADJUSTABLE PLANT HANGING DEVICE

Guy Gaube, 952 Gouin Ouest, Montreal Québec, Canada H3L 1K8

Filed Jul. 25, 1990, Ser. No. 557,636
Int. Cl.[5] B65H *75/00*
U.S. Cl. 248—330.1 **19 Claims**



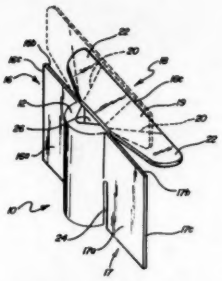
1. A height adjustable device for suspending an item, comprising a locking guide member adapted to be mounted above the item, a handle means having a reel means biasedly mounted thereto, and a cable means attached at a first end thereof to the item and at a second end thereof to said reel means with said cable means being guided intermediate said first and second ends by said locking guide member, said reel means urging said cable means to partly wind therearound, said locking guide member being adapted locking said cable means thereto between said first and second ends of said cable means for maintaining the item at a desired height, said locking guide member being also adapted for allowing movement of said cable means to displace therein when sufficient tension is provided to said cable means, whereby the item can be selectively lowered or raised, said sufficient tension resulting from a displacement of said handle means relative to said locking guide member that causes said cable means to unwind from said reel means, wherein, when said cable means is secured to said locking guide member, allowing said cable means to wind around said reel means causes said handle means to retract towards said locking guide member.

5,065,972

CORNER BUMPER

Dennis J. Buckshaw, 42240 Crestview Cir., Northville, Mich. 48167, and James A. Clark, 7309 Manor Cir. #202, Westland, Mich. 48185

Filed Oct. 4, 1990, Ser. No. 592,779
Int. Cl.[5] A47B *95/00*
U.S. Cl. 248—345.1 **9 Claims**



1. A protective bumper for mounting on the corners and edges of furniture and the like, comprising:

a substantially cylindrical, resilient bumper portion, having two side edges, two end edges, a rounded front face, and an interior surface opposite said front face, said interior surface configured such that it conforms only partially to said corner or edge upon which said resilient bumper portion is mounted;

first and second planar mounting flaps having front and rear planar faces, each of said flaps having one generally linear edge integral with a respective side edge of said resilient bumper portion and extending radially outwardly from the respective side edge, each of said flaps being otherwise free and unattached to any other portion of said bumper so that it may fold freely about its integral linear edge;

a third mounting flap connected only to one of said end edges of said resilient bumper portion, extending therefrom substantially coplanar with said first and second mounting flaps in an unfolded condition, and having end portions which are biased to fold at least one predetermined angle relative to said third flap; wherein,

said resilient bumper portion is positioned over a corner or edge of an article formed by at least two intersecting surfaces, with said rounded front face opposite said corner or edge, and said first, second and third mount flaps are folded to engage said article and each of said end portions is folded to engage one of said first and second mounting flaps.

5,065,973

SMOOTH SURFACE FIXING SETTER

Yeong-Jing Wang, 28-2, Feng-2 Lane, Feng Nian St., Shin Juang City, Taipei Shian, Taiwan

Filed Dec. 10, 1990, Ser. No. 618,604
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—362 **1 Claim**

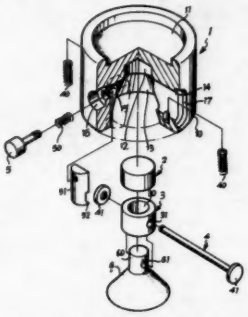
1. A smooth surface fixing setter comprising an accustomed rubber suction pad combined with a body to be fixed on a smooth surface for firmly holding liquid containers and other objects which easily fall down or slip off the surface, the setter including:

(a) a body having a setter on the top and a blind hole in the center of the bottom with a periphery of the blind hole extending obliquely to form a tapered hole, a transverse groove extending through the body on either side thereof, vertical sliding grooves being provided at the two ends of the transverse groove, and an oblique hole extending from the lateral side of the body at an angle and connecting a concave pad to the blind hole;

(b) a magnetic iron disposed inside the blind hole of the body, a transversal shift rod extending between the transverse grooves, two projecting buttons on the two ends of the shift rod and positioned in the sliding grooves, and the lower end of the shift rod being biased upwardly by two springs;

(c) a circular taper-shaped rubber suction cup having a tubular projecting rod on the top for insertion into a metallic chunk having holes extending through two sides for contacting with a hole extending through the tubular projecting rod of the rubber suction pad and allowing penetration of the transversal shift rod through the blind hole to cause the magnetic iron to magnetically attract the chuck;

(d) a push button having a slender rod extending into the oblique hole of the body, a spring biasing the push button



outwardly, a push lock disposed at a right angle to the slender rod and being able to slide in the concave path with its bottom forming a projecting hook; and

(e) wherein the smooth surface fixing setter is attached to a smooth surface by pressing the two projecting buttons downwardly to cause the transversal shift rod to separate the rubber suction pad ahd chuck from the magnetic iron and adhering the rubber pad to the smooth surface, and the rubber pad being detachable from the smooth surface by pressing the push button to cause the hook at the bottom of the push block to push the edge of the suction pad, thereby allowing air to enter the suction pad resulting from its losing suction, and the spring pushing upwardly against the transversal shift rod will cause the suction pad to return to its original position in which the chuck and the magnetic iron are affixed to each other through magnetic attraction.

5,065,974

MIRROR MICRO-RADIAN ANGULAR ADJUSTMENT, LOCKING, AND MOUNTING DEVICE AND PROCESS

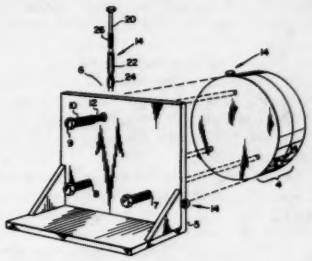
Roger H. Lapp, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Apr. 16, 1990, Ser. No. 509,383
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—476 **15 Claims**

1. An angular adjustment and locking device, said device mounting a mirror assembly to a support plate, comprising:

at least three adjustor bolts, said adjustor bolts being threadably engagted through said support plate and threadably engaged with said mirror assembly; and

two locking bolts for each of said adjustor bolts, one of said locking bolts being inserted in said support plate and lockingly engaged with that portion of said adjustor bolt inside said support plate and the second fo said locking bolts being inserted in said mirror assembly and lockingly engaged with that portion of said adjustor bolt inside said mirror assembly, each of said locking bolts compressingly engaging an arcuately-shaped, threaded section of each of said locking bolts onto said adjustor bolts thereby applying torque symmetrically when tightened to each of said



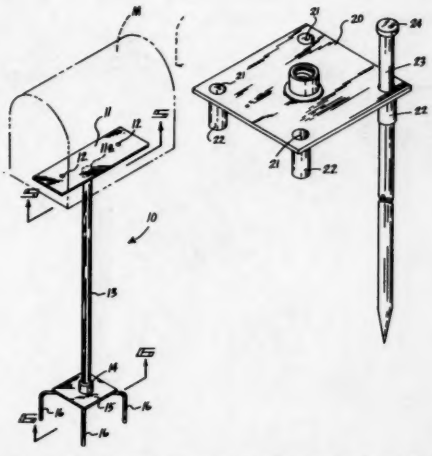
adjustor bolts and preventing both axial and radial movement in said adjustor bolts.

5,065,975

MAIL BOX SUPPORT APPARATUS

Homer Giles, 1434 E. Sunnyview, Visalia, Calif. 93291

Filed Nov. 5, 1990, Ser. No. 610,164
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—545 **1 Claim**



1. A mail box support apparatus for securement of a mail box thereon, including an upper support plate, the upper support plate fixedly securing at least one mail box thereon, and

the upper support plate including an internally threaded socket orthogonally and fixedly mounted medially to the bottom surface of the upper support plate, and

a lower support plate, including a lower internally threaded socket medially and fixedly mounted to an upper surface of the lower support plate, with the lower socket orthogonally mounted thereon, and

a post member, the post member including an upper threaded end and a lower threaded end, the upper threaded end threadedly received within the upper internally threaded socket, and the lower threaded end threadedly received within the lower threaded socket, and

mounting means for securement of the lower support plate to an underlying ground surface, and

wherein the mounting means include a plurality of spike members, each spike member mounted orthogonally relative to the lower support plate and oriented at ninety degree intervals about the support plate to include four spike members, and

wherein the mounting means further includes a corner opening orthogonally directed through the support plate adjacent a circumferential periphery defined by the support plate, with each corner opening arranged ninety degrees relative to an adjacent corner opening to include four corner openings, and a corner support tube fixedly and orthogonally mounted to a bottom surface of the lower support plate coaxially aligned with each corner opening, and each corner opening defined by a first diameter, and each corner opening and corner support tube slidably receiving a spike member therethrough, and

wherein each spike member includes a spike head fixedly mounted to an upper terminal end of each spike member, wherein the spike head is defined by a second diameter greater than the first diameter, and a lower terminal end defined by a pointed projection, and

wherein each spike member includes a socket cavity coaxially directed through each spike head, and each spike member further includes an external thread formed integrally to an exterior surface of each spike, and

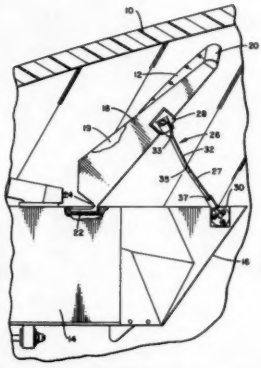
wherein the upper mounting plate includes a plurality of spaced rails, and the spaced rails include plural pairs of "L" shaped flange members mounted thereon to permit securement of a mail box between each of the flange pairs.

5,065,976

SUPPORT STRUCTURE

George Woody, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 31, 1989, Ser. No. 429,897
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—549 **15 Claims**



1. A support structure comprising:

a base;

a side bracket, a member supported on said side bracket;

hinge means interconnecting said side bracket and said base;

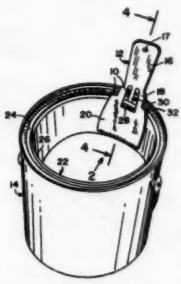
a rigid strut connected to said side bracket and to said base to rigidly support said side bracket and said member supported thereby, said rigid strut being configured to collapse by columnar failure when a force approaching member breaking force is applied to said member so that said member and said side bracket swing down around said hinge means.

5,065,977

INTEGRAL TOOL AND CLIP FOR VERTICAL SUPPORT IN A CONTAINER

Warren Desjardin, 18 Bonita Rd., East Quogue, N.Y. 11942

Filed Jul. 25, 1990, Ser. No. 557,659
Int. Cl.[5] A47B *91/00*
U.S. Cl. 248—692 **9 Claims**



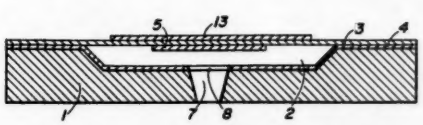
1. A one-piece, uniplanar tool for securing to the rim of an open mouthed container of the type having an annular rim with an upwardly opening annular groove and an annular, inwardly extending lip, the tool comprising an upper, flat handle portion connected to a lower, flat blade portion by a flat heel portion and a flat, resiliently flexible tongue having an upper, root end integral with the heel portion, and a lower, downwardly facing, groove engaging free end, a pair of upwardly facing, lip engaging shoulders spaced apart from respective opposite sides of the tongue defined by notches formed in respective opposite side edges of the tool at a location between the blade portion and the handle so that the tongue can be flexed with the groove engaging end received in the groove to engage the shoulders under the inwardly extending annular lip thereby clipping the tool onto the rim with the blade portion extending vertically into the container.

5,065,978

VALVE ARRANGEMENT OF MICROSTRUCTURED COMPONENTS

Scato Albarda, Gross Schenkenberg; Werner Thoren, Lubeck; Stefan Kahning, Steinburg, and Peter Vehrens, Sulfeld, all of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Lubeck, Fed. Rep. of Germany

Division of Ser. No. 334,919, Apr. 17, 1989. This application Sep. 19, 1990, Ser. No. 584,762
Int. Cl.[5] F16K *31/02, 31/08, 7/12*
U.S. Cl. 251—129.06 **3 Claims**



1. A microstructured valve arrangement, comprising: a basic body structure defining a flow path having an opening; an actuation member connected to said basic body structure so as to be supported in a rest position, spaced away from said opening, and supported in an extended position, disposed over said opening; actuating drive means connected to said actuation member for moving said actuation member from said rest position to said extended position; and, holding means independent of said actuation drive means for retaining said actuation member in said extended position, said actuating drive means

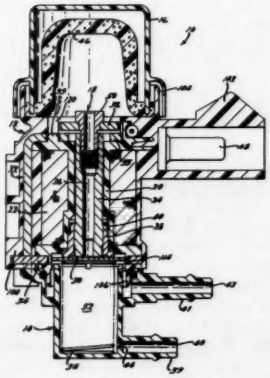
comprising a piezo actuation crystal drive element including a piezo electric element acting on said actuation member.

5,065,979

CONSTANT CURRENT VACUUM REGULATOR

Charles A. Detweiler, Durand, and Richard A. Schultz, Troy, both of Mich., assignors to Lectron Products, Inc., Rochester Hills, Mich.

Continuation of Ser. No. 463,470, Jan. 10, 1990, abandoned. This application Oct. 10, 1990, Ser. No. 595,201
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.16 24 Claims



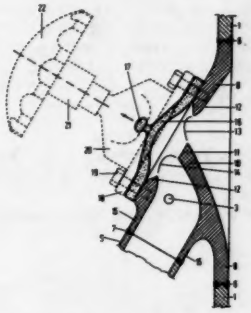
1. An electromagnetic solenoid valve assembly comprising:
a valve housing defining a fluid chamber;
a fluid passageway communicating with said fluid chamber;
a magnetic pole piece having a top and a bottom end;
a seat member extending beyond the bottom end of said pole piece;
a magnetic closure member located a predetermined distance from the bottom end of said pole piece and adapted to control the flow of fluid through said fluid passageway, said predeteremined distance between said magnetic closure member and the bottom end of said pole piece defining a primary air gap in the magnetic flux path of the solenoid;
first flux collector means for completing the magnetic flux path from the top end of said pole piece to said magnetic closure member, said first flux collector means defining a secondary air gap in said magnetic flux path at the top end of said pole piece between said pole piece and said first flux collector means and hence a first flux path across said secondary air gap;
adjustable flux collector means defining a supplemental flux path across aid secondary air gap in parallel with said first flux path;
means for establishing the flow of electromagnetic flux through said flux paths; and
calibration means for varying the position of said adjustable flux collector means relative to said first flux collector means to vary the reluctance in said supplemental flux path.

5,065,980

DIAPHRAGM VALVE

Borge C. Pedersen, Holstensvejen 26, 4534 Horve, Denmark

Filed Jun. 18, 1990, Ser. No. 539,659
Claims priority, application Denmark, May 22, 1989, 2479/89
Int. Cl.[5] F16K *7/16*
U.S. Cl. 251—144 5 Claims



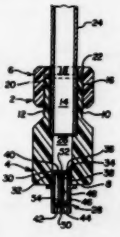
1. A diaphragm valve primarily to be fitted in a container wall, comprising:
a) a valve housing (9) having a valve inlet port or opening (13) communicating with the fluid inside the container, a valve outlet port or opening (14, 15) for extracting fluid from the inside of the container, and valve seats (11, 12) surrounding the valve inlet port (13)
b) a flexible diaphragm (16, 17) mounted movable for shifting between an open and a closed position, and
c) actuator means (22) for shifting the diaphragm between the open and a closed position,
wherein the valve housing (9) forms an integral part of the container, whereby the valve inlet port (13) also functions as a container outlet port or opening; the surface of the diaphragm (16) facing the inside of the container in the closed position is geometrically close to the inner outline of the container, and abuts directly against the valve seats (11, 12) surrounding the valve inlet port (13) and valve outlet port (14) simultaneously closing both the valve inlet and outlet ports (13, 14) with uniform deformation of the diaphragm.

5,065,981

WATER LINE TEST CAP

Fred F. Vario, 1057 Waterman Rd., Jefferson Borough, Pa. 15025

Filed Oct. 9, 1990, Ser. No. 594,693
Int. Cl.[5] F16L *55/10*
U.S. Cl. 251—148 4 Claims



4. A novel water line test cap comprising an elongated body closed at one end and having an elongated cylindrical recess extending outwardly therefrom and external threads at the other end thereof, an internally-threaded nut threaded to said elongated body at said other end thereof, said nut being pro-

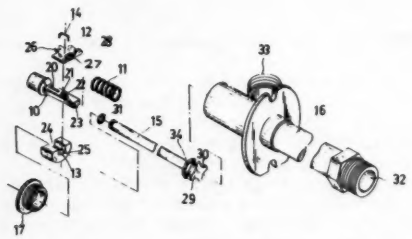
vided with a bore communicating with said elongated cylindrical recess, and an expandable O-ring disposed therein adjacent said elongated body, said cylindrical recess, said bore and said O-ring being linearly disposed and having the same internal diameter sufficient to permit the entry of a water pipe therein, said O-ring being disposed between the outer free edge of said elongated body and the adjacent surface of said nut, the closed end of said body being provided with means capable of bleeding the interior of said water line test cap comprising a body mounted in said elongated body communicating with said elongated cylindrical recess and having disposed therein spring-activated valve means permitting communication between said elongated cylindrical recess and the exterior thereof.

5,065,982

PUSH-BUTTON TYPE CONTROLLING-WATER DEVICE

Sen-Tein Shih, No. 41, Yi-Ya Lane, Sio-Sue Hsiang, Chang-hua Hsien, Taiwan

Filed Oct. 25, 1990, Ser. No. 603,073
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—320 **2 Claims**



1. A push-button water control device comprising:

a press control rod having a cylindrical button on the end and a rectangular rod portion with a rectangular leading groove, a heart-shaped positioning groove and a heart-shaped positioning piece, and a rectangular piece extending downward;

a fixed base having a semicircular cross section with a small leading concave groove in the middle;

an upper fixed cover having a round hole and a rectilinear and a semicircular circled shield;

a positioning member inserted into said round hold and into said rectangular leading groove, and entering into said rectilinear hole and said heart-shaped positional groove at the other end; and

a spring mounted between said cylinder button and said fixed base.

5,065,983

HYDRAULIC POWER UNIT FOR JACK SYSTEM

Clyde E. Slay, Santa Ana, Calif., assignor to Safe-T-Jack, Inc., Huntington Beach, Calif.

Filed Apr. 3, 1990, Ser. No. 504,552
Int. Cl.[5] B66F *3/24*
U.S. Cl. 254—8 B **3 Claims**

1. A hand-operated hydraulic power unit for a jack system comprising, in combination:

(a) hydraulic fluid reservoir means;

(b) means defining a flow path for fluid to flow out of, and then back into, said reservoir means;

(c) manually operated pump means for forcing fluid out of said reservoir means along said flow path;

(d) a hydraulic cylinder having one end thereof in communication with said flow path;

(e) a hydraulic ram in the other end of said hydraulic cylinder for lifting a pair of pivotally mounted lifting arms;

(f) a pivotally supported pressure release lever;

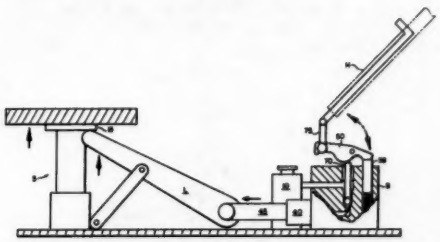
(g) resilient means engaging said release lever on one side of its pivotal support for forcing said lever to rotate in one direction relative to its pivotal support;

(h) said flow path having an outlet port forming a valve seat therein;

(i) a ball valve member normally seated upon said valve seat;

(j) actuating rod means housed partially within said flow path, seated upon said valve member and engaging said release lever on the other side of its pivotal support for forcing said lever to rotate in the other direction relative to its pivotal support;

(k) said means defining a flow path including a metal block having a series of interconnected straight passageways formed therein, said outlet port and valve seat being formed by one end of one of said passageways, and the other end of said one passageway extending beyond said flow path and housing said actuating rod means; and



(l) manual means for selectively rotating said release lever in said other direction of rotation;

whereby when said pump means is operated for forcing fluid to flow from said reservoir means into said flow path it builds up fluid pressure against said valve member, then whenever the pressure against said valve member exceeds a predetermined level it is applied by said actuating rod means to said pressure release lever so as to overcome said resilient means and thereby cause said lever to move, so that excess pressure escapes past said valve member along said flow path and back into said reservoir means; and

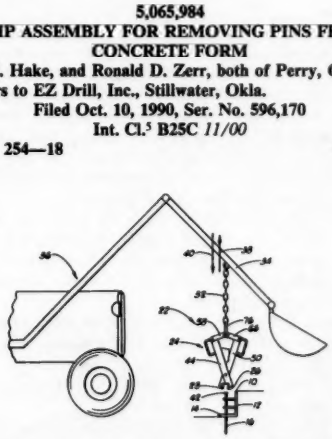
whereby when it is desired to unload the pressure against said hydraulic ram said manual means is operated so as to permit said valve member to be raised from its seat and the entire fluid pressure in said cylinder to be bled off to said reservoir means.

5,065,984

CLAMP ASSEMBLY FOR REMOVING PINS FROM A CONCRETE FORM

Leon M. Hake, and Ronald D. Zerr, both of Perry, Okla., assignors to EZ Drill, Inc., Stillwater, Okla.

Filed Oct. 10, 1990, Ser. No. 596,170
Int. Cl.[5] B25C *11/00*
U.S. Cl. 254—18 **2 Claims**



1. An improvement in an apparatus for pullingly removing pins having a pin head on one end thereof from a concrete form using an existing lifting mechanism having a lift portion mov-

able in an upwardly direction and in a downwardly direction, the improvement comprising:

a clamp assembly a having a first jaw and a second jaw connected thereto, the clamp assembly being movable to an opened position wherein the first and the second jaws are spaced a distance apart, and the clamp assembly being movable to a closed position wherein the first and the second jaws are positioned in clamping engagement with the pin to be removed , the clamp assembly comprising:

a first clamp arm having a first end and a second end, the first jaw being connected to the second end of the first clamp arm;

a second clamp arm having a first end and a second end, the second jaw being connected to the second end of the second clamp arm;

means for pivotally connecting the first clamp arm at a position between the first and the second ends of the first clamp arm to the second clamp arm at a position between the first and the second ends of second clamp arm, the a means for connecting the clamp assembly to the lift position being connected to the first ends of the first and second clamp arms;

a first lift arm having a first end and a second end, the first end of the first lift arm being pivotally connected to the first end of the first clamp arm;

a second lift arm having a first end and a second end the first end of the second lift arm being pivotally connected to the first end of the second clamp arm, and the second end of the second lift arm being pivotally connected to the second end of the first lift arm, the means for connecting the clamp assembly to the lift portion being connected to the second ends of the first and the second lift arms;

an eye flange having an eye opening formed therethrough the means for connecting the clamp assembly to the lift portion of the lifting mechanism being connected to the eye flange;

a first handle; and

a second handle, the first and the second handles each being adapted to be gripped for manually moving the clamp assembly to the opened position and the closed position;

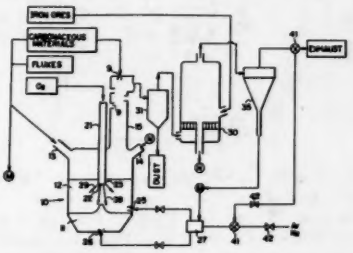
means for connecting the clamp assembly to the lift portion of the lifting mechanism, the clamping assembly being moved to the opened position a and positioned over the pin to be removed, and the lift portion being movable a distance in the upwardly direction for moving the clamp assembly a distance int e upwardly direction and causing the clamp assembly to be moved toward the closed position wherein the first and the second jaws clampingly engage the pin to be removed, and the lift portion being movable a further distance into upwardly direction for pulling the clamp assembly the pin connected thereto via the first and second jaws in the upwardly direction for pullingly removing heaping the pulling of the clamp assembly int e upwardly direction continues to move the clamp assembly toward the closed position for maintaining the clamping engagement between the clamp assembly and the pin as the lift portion continues to move in the upwardly direction.

5,065,985

METHOD FOR SMELTING REDUCTION OF IRON ORE AND APPARATUS THEREFOR

Kenji Takahashi; Katsuhiro Iwasaki; Shigeru Inoue; Haruyoshi Tanabe; Masahiro Kawakami; Kenzo Yamada, and Osamu Terada, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Division of Ser. No. 276,612, Nov. 28, 1988, Pat. No. 5,000,789.
This application May 8, 1990, Ser. No. 520,785
Claims priority, application Japan, Nov. 30, 1987, 62-303940; Feb. 9, 1988, 63-28584; Feb. 9, 1988, 63-28586
Int. Cl.[5] C21C *5/38*
U.S. Cl. 266—156 **12 Claims**



1. An apparatus for a smelting reduction of iron ore comprising:

a preheat and prereduction furnace means for preheating and prereducing iron ore;

a smelting reduction furnace means into which preheated and prereduced iron ore from said preheat and prereduction furnace means, carbonaceous material and flux are charged and in which said preheated and prereduced iron ore is smelted and reduced, said smelting reduction furnace means having a bottom wall and side walls;

a top blow oxygen lance having decarburizing nozzles and post-combustion nozzles at one end thereof for blowing oxygen into molten metal contained in said smelting reduction furnace means;

at least one side tuyere disposed in a side wall of the smelting reduction furnace means and at least one bottom tuyere disposed at the bottom of the smelting reduction furnace means through which a stirring gas is blown through molten metal contained in the smelting reduction furnace means to cause a portion of the upper surface of the molten metal to swell upwardly, at least a part of said stirring gas blown through said at least one side tuyere being directed at the upwardly swollen portion of the molten metal to agitate said molten metal; and

at least one upgrading tuyere through which a gas upgrading agent is blown to an infurnace gas generated from said smelting reduction furnace means, said upgrading tuyere being disposed in a gas exhaust pipe which leads the infurnace gas from the smelting reduction furnace means to the preheat and prereduction furnace means.

5,065,986

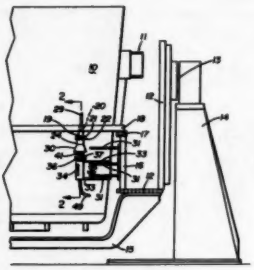
AUTOMATIC GAS HOOKUP TO A LADLE

Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio

Filed Jul. 30, 1990, Ser. No. 559,835
Int. Cl.[5] C21C *5/46*
U.S. Cl. 266—217 **5 Claims**

1. An automatic hookup for coupling a ladle to a gas supply for treatment of molten metal in the ladle wherein gas is injected into the molten metal and wherein an annular flange on said ladle rests on ladle saddles in a tilting structure comprising: apertured female connection means depending from said annular flange, said female connection means consisting of a cylindrical body, a half spherical concave member in said

cylindrical body, an inverted conical flange depending from said concave member, a support beam on said tilting structure apertured male connection means consisting of telescopic body members on said support beam, spring means on said telescopic body members, an upper plate on said spring means, a convex curved upper end portion having a downturned annular flange, said annular flange secured to said upper plate so as to space



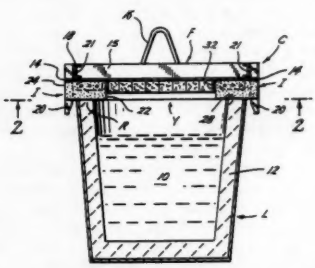
said convex curved upper end portion from said upper plate, said half spherical concave member being of a known spherical diameter and said convex curved upper end portion being of a spherical diameter greater than said known diameter of said spherical concave member, means communicating with said ladle and said female connection and means communicating with said male connection and a gas supply.

5,065,987

REFRACTORY CERAMIC FIBER LADLE COVERS

Mack A. Hounsel, Houston, Tex., assignor to J T Thorpe Company, Houston, Tex.

Continuation of Ser. No. 665,927, Oct. 29, 1984, abandoned, and a continuation-in-part of Ser. No. 564,745, Dec. 21, 1983, Pat. No. 4,492,382. This application Oct. 31, 1988, Ser. No. 265,239
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.[5] C21C *5/44*
U.S. Cl. 266—283 **9 Claims**



1. An apparatus for sealing the top of a ladle as it is positioned beneath a ladle cover comprising:

(a) a plurality of refractory fiber ring insulation units, each of said units comprising:

(1) a plurality of adjacent layers of refractory ceramic fiber insulating material;

(2) said layers having an inner surface portion adjacent the ladle cover;

(3) said layers further having an outer surface portion adapted to be contacted by the rim of the ladle;

(4) said layers further having intermediate portions extending between said inner and outer surface portions;

(b) means for mounting said plurality of refractory fiber insulation units beneath the ladle cover, said means for mounting comprising means for mounting said layers in a round patter about a peripheral portion of a lower surface of the ladle cover;

(c) said layers being mounted on said means for mounting in planes extending radially outwardly from a central portion of the ladle cover; and

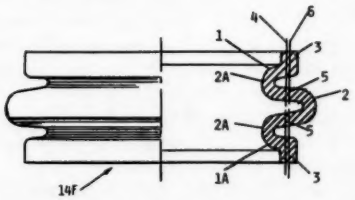
(d) a layer of refractory fiber insulation mounted within said round pattern of said layers.

5,065,988

SPRING FOR COMPRESSION AND TENSION, MAINLY IN AXIAL DIRECTION

Anders S. Wedell, Munkegaardsvej 2A, Dk-3490 Kvistgaard, Denmark

PCT No. PCT/DK88/00133, § 371 Date Mar. 14, 1989, § 102(e) Date Mar. 14, 1989, PCT Pub. No. WO89/01577, PCT Pub. Date Feb. 23, 1989
PCT Filed Aug. 11, 1987, Ser. No. 460,199
Claims priority, application Denmark, Aug. 11, 1987, 4172/87
Int. Cl.[5] F16F *1/36*
U.S. Cl. 267—149 **13 Claims**



1. A spring for compression and tension comprising:

a substantially cylindrical hollow body having a central longitudinal axis, opposite ends and a wall between said ends of substantially constant thickness and comprising at least two radially directed substantially U-shaped sections integrated to form spring parts and being symmetrical about said axis and functioning substantially in the axial direction, said U-shaped sections forming in cross-section radially outer and inner wave crests at respective inner and outer diameters, and said body being made of a material selected from the group consisting of metal, steel, glass, plastic, and reinforced plastic, and having a Young's modulus E of at least 39 GPa; and

an end section at each end comprising an annular rigid axial projection extending between said inner and outer wave-crest diameters so that a neutral surface of the spring passes through said end sections.

5,065,989

WORKTABLE

Cheng W. Ho, 12-2 Alley 1, Lane 437, Sec. 2, Pader Road, Taipei, Taiwan

Filed Jun. 4, 1990, Ser. No. 532,917
Int. Cl.[5] B25B *1/22*
U.S. Cl. 269—139 **2 Claims**

1. A worktable, comprising:

a tabletop comprising a pair of fixture receiving frames extending generally parallel, each frame having opposite ends and a center between its ends;

two pairs of legs for support the tabletop, the legs having top and bottom ends, the leg top ends of one of the legs of each pair of legs being pivotally connected to the tabletop generally toward the center of a respective one of the frames between the ends of that frame, the one leg being pivotable to selectively move the one leg to a support position of the legs wherein the bottom ends of the legs of each pair are separated and to a folded position of the legs wherein the bottom ends of the legs of each pair are toward each other; the frames being connected with the

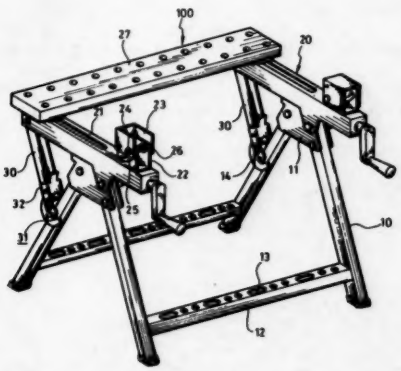
respective leg pairs such that the tabletop can be lifted upright while the leg pairs are in the folded position;

a respective pair of fixtures on each frame, and means in each frame for adjusting the distance between the fixtures on that frame for enabling the clamping of an article between the fixtures on that frame;

a support arm having an upper end which is pivotally connected to one end of one frame at a location spaced away from the pivot connection of the respective one leg to the one frame, the support arm having a lower end with a dent formed therein;

a pin formed on the one leg at the one frame and the pin being placed for being received in the dent of the support arm, and such reception of the pin in the dent fixing the legs in their supporting position and fixing the one leg against pivoting to the legs folded position, while separation of the pin from the dent in the support arm frees the one leg to pivot to the legs folded position; slidable fixing means on the support arm, the fixing means being slidable from a position opening the dent for permitting the locating pin on the leg to move in and out of the dent to a closed position for locking the pin in the dent;

each fixture comprising a lower part connected to the top of the respective frame and an upper part pivotally connected to the lower part at a pivot connection for enabling



the upper part to be pivoted from a first orientation to a second orientation perpendicular to the first orientation;

the tabletop further comprising a respective top board attached at a location on each fixture upper part such that pivoting of the fixture upper part moves the board between a flat, generally horizontal orientation and an upright, generally vertical orientation;

the upper and lower fixture parts each respectively comprising two spaced apart sides, a retaining pin defined on at least one side of the upper part, at least one side of the lower part having a pivot guide slot defined therein, the sides of the upper part being respectively placed outward of the respective sides of the lower part, the retaining pin of the upper part extending from the side of the upper part through the guide slot in the side of the lower part;

a spring on the retaining pin, means on the retaining pin for being engaged by the spring and those means being biased outwardly by the spring into engagement with at least one side of the lower part for restraining movement of the retaining pin along the guide slot, thereby for restraining pivoting of the upper part with respect to the lower part;

the pivot connection between the upper and lower parts being spaced from the retaining pin and the guide slot, the guide slot being curved to permit pivoting of the retaining pin along with the pivoting of the upper part.

5,065,990

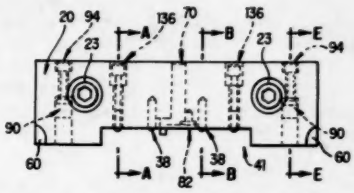
VISE JAW ACCESSORY SYSTEM FOR ATTACHING AND RELEASING VISE ACCESSORIES WHILE MAINTAINING POSITIONAL ACCURACY OF THE ACCESSORIES

David Durfee, Meadville, Pa., assignor to Susan M. Durfee, Meadville, Pa.

Continuation-in-part of Ser. No. 495,777, Mar. 19, 1990, which is a continuation of Ser. No. 223,428, Jul. 25, 1988, Pat. No. 4,923,186, which is a continuation-in-part of Ser. No. 941,717, Dec. 15, 1986, abandoned. This application Dec. 31, 1990, Ser. No. 636,250

Int. Cl.[5] B25B *1/24*

U.S. Cl. 269—282 **29 Claims**



1. A vise jaw system for a vise having a keyway defining a longitudinal direction, a lateral direction perpendicular to said longitudinal direction, a horizontal datum surface along which a bottom surface of a movable jaw moves and a vertical datum surface being one of the longitudinal vertical walls of said keyway, the system comprising:

at least one removable jaw for selective attachment to said vise, said removable jaw having a bottom surface held in fixed relation to said horizontal datum surface and a front surface perpendicular to said horizontal datum surface, said removable jaw further including a recess formed in a portion of the bottom and front surfaces of the removable jaw, the recess having a lateral length less than a lateral length of the bottom surface;

at least one positioning plate for selective attachment to said removable jaw, said positioning plate having a bottom face for contacting the horizontal datum surface and a rear face perpendicular to said horizontal datum surface;

said positioning plate further including an elongated cleat fixed to the positioning plate along the lateral direction adjacent to the bottom face of the positioning plate, said cleat including a side face at one end of said cleat, said cleat having a shape sized for insertion in the longitudinal direction of said vise;

pressure means located in one of the removable jaw and the cleat for engaging said cleat when received in said recess to urge the bottom face of said positioning plate along the lateral direction against said horizontal datum surface and the rear face of the positioning plate in a securement direction against the front surface of the removable jaw; and

lateral alignment means for maintaining the side face of the cleat in fixed relation to the vertical datum surface whereby said positioning plate is located and held in precise alignment in all directions.

5,065,991

APPARATUS FOR FIXING A WORKPIECE TO THE WORKTABLE OF A MACHINE TOOL

Rudolf Schneider, Stansstad, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Jun. 6, 1990, Ser. No. 533,876

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919077

Int. Cl.[5] B23Q *1/08*

U.S. Cl. 269—309 **11 Claims**

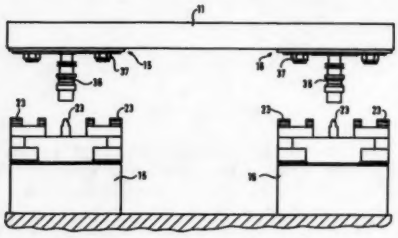
1. An apparatus for fixing a workpiece to be machined by a

machine tool to the worktable of said machine tool in an exactly determined positional relationship with reference to a reference point located on said worktable of said machine tool, said apparatus comprising:

a workpiece receiving means adapted to removably receive said workpiece to be machined;

first positioning means comprising a first group of positioning apertures provided in said workpiece receiving means and a first group of positioning studs provided on said worktable of said machining tool, said first group of positioning apertures and said first group of positioning studs cooperating to determine the position of said workpiece receiving means in X- and Y-directions;

second positioning means comprising a second group of positioning apertures and a second group of positioning studs, said second groups of positioning apertures and positioning studs being located distantly from said first



groups of positioning apertures and positioning studs and cooperating with each other whereby said cooperating second groups of positioning apertures and positioning studs determine the position of said workpiece receiving means either only in the X-direction or only in the Y-direction; and

said workpiece receiving means comprises at least two positioning members located distantly from each other, each of said positioning members comprising a positioning plate, the positioning plate of a first positioning member being provided with four positioning slits, the arrangement of said four positioning slits corresponding with the arrangement of the positioning studs of said first group of positioning studs, and the positioning plate of a further positioning member being provided with two positioning slits which are located on the tie line running from the center of said first positioning member to the center of said further positioning member.

5,065,992

METHOD FOR PROCESSING WEB MATERIAL

H. W. Crowley, Newton, Mass., assignor to Roll Systems, Inc., Burlington, Mass.

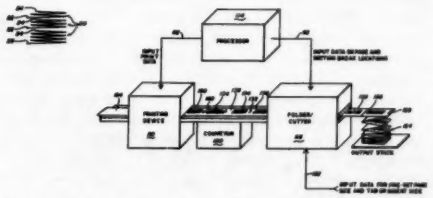
Filed Jun. 7, 1990, Ser. No. 534,724
Int. Cl.[5] B41L *1/32*
U.S. Cl. 270—39 **34 Claims**

1. A method for sorting, separating and indicating sections of an outputted stack of printed continuous paper web comprising the steps of:

outputting a continuous paper web including a plurality of sections having pages therein;

determining page separation and section separation locations upon the web, wherein the size of each page in a section is equal;

determining section separation locations upon the web wherein the size of at least one section separator page disposed adjacent to a section separation location is unequal to the size of the pages in the section, the section separator page containing information descriptive of the section contents; and



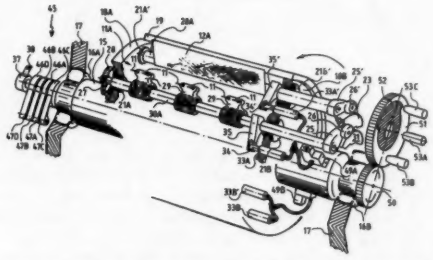
folding the web at each of the page separation locations so that each consecutive fold is placed upon a alternating face of the web to produce a zig-zag pattern.

5,065,993

ACCUMULATOR CYLINDER ASSEMBLY FOR A FOLDING MACHINE OF A PRINTING PRESS

André Reponty, Gouvieux, France, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 18, 1990, Ser. No. 629,400
Claims priority, application France, Dec. 18, 1989, 89 16709
Int. Cl.[5] B42C *1/00*
U.S. Cl. 270—49 **20 Claims**



1. Accumulator cylinder assembly for a folding machine of a printing press having tucking-blades respectively associated with entrainer members and cutting countermembers, and a device for controlling the tucking-blades and the entrainer members including, for each tucking-blade, a tucking-blade shaft having an insertion position in which the respective tucking-blade is deployed in order to insert paper covering the respective tucking-blade into a jaw of a jaw cylinder cooperating with the accumulator cylinder, and a retracted position in which the tucking-blade is retracted; a fixed tucking-blade shaft control cam having a control region on a periphery thereof, each tucking-blade shaft having a lever carrying a roller resiliently held against the cam, the tucking-blade shaft being in the insertion position when its roller is in the control region, and being in the retracted position when the roller is not in the control region, the cam being disposed so that its control region is located opposite the roller of the tucking-blade shaft when the tucking-blade associated with the shaft is aligned with the respective jaw of the jaw cylinder; for each

entrainer member, an entrainer shaft having an entraining position in which the paper is firmly held on the accumulator cylinder, and a release position in which the paper is released; a fixed entrainer shaft control cam having a control region on a periphery thereof, each entrainer shaft having a lever carrying a roller held resiliently against said cam, each entrainer shaft being in a release position when its roller is in the control region of the entrainer shaft control cam and in the entraining position when its roller is not therein, the cam being disposed so that its control region is located opposite the roller of the entrainer shaft when a tucking blade preceding the respective entrainer member associated with the entrainer shaft is located opposite the respective jaw of the jaw cylinder; the control device further comprising:

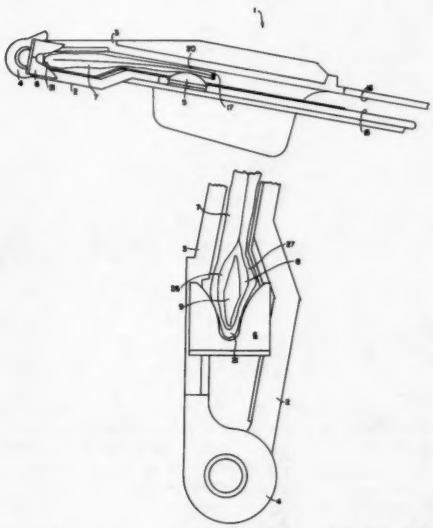
for each entrainer shaft and each tucking-blade shaft, a latch fixed to the accumulator cylinder and having an operating position in which the latch blocks the shaft to prevent its roller from being affected by the respective control region of the respective cam thereof and a non-operating position in which the latch does not act on the shaft; latch-signal production means for generating at least one series of periodic signals according to the angular position of the accumulator cylinder, in order to cause it to operate in an accumulation mode; means for enabling said latches to respond to said signals wherein each latch assumes said operating position thereof when a signal is addressed to it, and said non-operating position thereof when no signal is addressed to it; and means for selecting the operating mode of the cylinder wherein corresponding signals are fed to said latches.

5,065,994

NON-LAP OPENER

Walter Hatt, Yardley, Pa., assignor to Graphic Management Associates, Inc., Mass.

Filed Feb. 13, 1991, Ser. No. 654,741
Int. Cl.[5] B65H *5/30*
U.S. Cl. 270—55 **16 Claims**



1. A device for opening a printed product which has a fold, an unfolded edge parallel to and spaced apart from said fold, and first and second sides extending between said open edge and said fold, at least one of said first side and said second side being unfolded,

(a) said device comprising a pocket for said printed product and having a first wall and a second wall connected by a hinge, said first wall and said second wall pivoted at said hinge for motion toward each other into a closed position and away from each other into an open position, said fold being adjacent said hinge,

(b) at least one abutment on a first inner face of said first wall or a second inner face of said second wall, an abutment area on the other of said first wall or said second wall and adjacent said abutment when said pocket is in said closed position, whereby said product is held between said abutment and said area and movement thereof in a first direction away from said hinge is prevented,

(c) a pressing element adapted to contact said fold and exert pressure thereon in said first direction, thereby forming an opening adjacent said fold between first and second groups of pages of said product,

(d) a preopener, adjacent said first side, adapted for movement into said opening in a second direction parallel to said fold, thereafter moving in said first direction, thereby dividing said groups substantially from said opening to said edge adjacent said first side,

(e) an opener, adapted to contact said product, at a first point adjacent said first side and said edge,

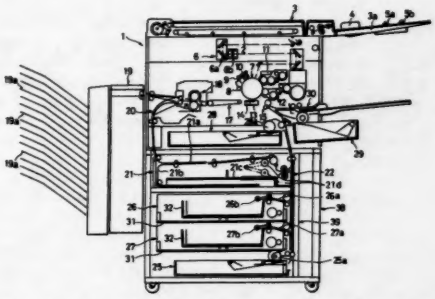
(f) said opener further adapted for movement in said second direction along said edge to a second point adjacent said second side and said edge, thereby dividing said product into said groups across its entire width.

5,065,995

SHEET SUPPLYING DEVICE

Ken Iwamoto, Nara, and Atsushi Narukawa, Koriyama, both of Japan, assignors to Sharp Kabsuhiki Kaisha, Osaka, Japan

Filed May 10, 1990, Ser. No. 521,693
Claims priority, application Japan, May 16, 1989, 1-122496
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—9 **10 Claims**



1. A sheet supplying device for supplying a sheet to a sheet supplied apparatus which designates the size and transport direction of the sheet, comprising:

a movable sheet placing means having a plane for placing the sheet thereon and movable to at least two transport positions so as to transport the sheet therefrom in at least two transport directions;

a fixed sheet placing means having a plane for placing the sheet thereon and fixed in one transport position so as to transport the sheet therefrom in one transport direction;

a transport means for transporting the sheet from each of the movable sheet placing means and the fixed sheet placing means to the sheet supplied apparatus; and

a control means, to which the size of the sheet placed on the movable sheet placing means and the size and transport direction of the sheet placed on the fixed sheet placing

means are input, for comparing the inputted size of the sheet placed on the movable sheet placing means and the inputted size of the sheet placed on the fixed sheet placing means, setting a flag in case that the compared sizes are same to each other, and selecting preferentially the fixed sheet placing means as the sheet placing means from which the sheet is transported by the transport means with reference to the set flag, when the size of the sheet placed on the movable sheet placing means corresponds to the designated size and, at the same time, the size and transport direction of the sheet placed on the fixed sheet placing means correspond to the designated size and transport direction.

5,065,996

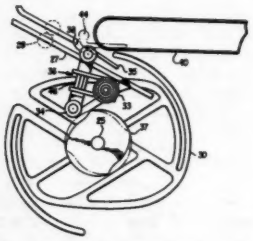
DISK STACKER INCLUDING MOVABLE GATE FOR INSERTION OF SHEETS INTO DISK SLOTS

Thomas C. McGraw, Macedon; Randall E. Van Ryne, Rochester; Richard F. Scarlata, Greece, and Cho Y. Sze, Fairport, all of N.Y., assignors to Xerox Corporastion, Stamford, Conn.

Filed Aug. 17, 1990, Ser. No. 568,782

Int. Cl.[5] B65H *29/40*

U.S. Cl. 271—176 **15 Claims**



1. A disk stacker for receiving and inverting sheets, comprising:

a rotatable disk including at least one slot for receiving a sheet therein;

rotating means for rotating said rotatable disk;

feeding means for feeding a sheet from a sheet supply to said slot of said rotatable disk, said rotatable disk being capable of receiving a sheet insaid slot when located at an input position, and inverting the sheet by rotating;

a movable gate positioned adjacent to said rotatable disk at said input position, and being movable between first and second positions, said first position being closer to said rotatable disk than said second position,; and

moving means for moving said gate between said first and second positions in synchronism with rotation of said rotatable disk, wherein said moving means moves said movable gate to said fist position every time said disk is at said input positions that said gate contacts and assists a sheet for insertion of the sheet into said slot, said moving means moving said gate to said second position upon rotation of said disk from said input position, so that said gate does not contact a trailing portion of the sheet.

5,065,997

SHEET INVERTER AND STACKING APPARATUS

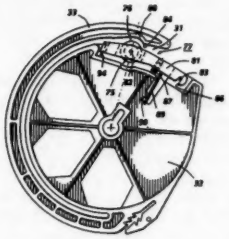
Richard E. Butts, and John C. Davis, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 26, 1990, Ser. No. 484,962

Int. Cl.[5] B65H *29/00*

U.S. Cl. 271—187 **21 Claims**

1. Sheet inverter and stacking apparatus comprising at least one sheet inverter wheel having at least one arcuate sheet retaining slot into which a sheet maybe inserted, means to incrementally rotate said wheel from a sheet load position to a sheet unload position; drive means to drive a sheet in the process direction into said slot when said inverter wheel is in the load position; means to remove a sheet from said slot, stack it in a stacking tray and register its leading edge; said sheet retaining slot comprising means to provide minimal resistance to sheet movement in the slot upon insertion in the slot in the process direction and to provide high resistance to sheet movement in the slot in a sideways direction transverse to the process direction comprising a sheet guide member on the entrance to said arcuate sheet retaining slot and a roller assembly



in the entrance to said arcuate sheet retaining slot, said roller assembly comprising a roller having a frictional contact surface rotatably mounted for free rotation in the process direction, said guide member being in opposed relationship with said roller, said guide having a portion forming with said roller an interference in the nominal tangential sheet path thereby providing a high resistance to sheet movement in the slot in a sideways direction transverse to the process direction.

5,065,998

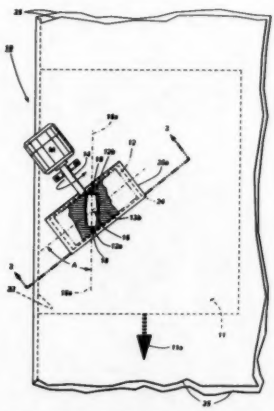
LATERAL SHEET REGISTRATION SYSTEM

James A. Salomon, Cheshire, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1990, Ser. No. 629,866

Int. Cl.[5] B65H *9/16*

U.S. Cl. 271—251 **10 Claims**



1. A positive lateral side edge registration and feeding system for feeding sheets in a primary sheet feeding direction and velocity yet also providing lateral repositioning of said sheets in a side registration direction, comprising a hub member rotatable about a central axis of rotation so as to rotate primarily in said primary sheet feeding direction but at an acute small lateral angle thereto, said hub member having rollers mounted to the periphery of said hub member for engaging said sheets, which rollers are rotatable with said hub member to impart sheet feeding forces to said sheets in both said primary sheet

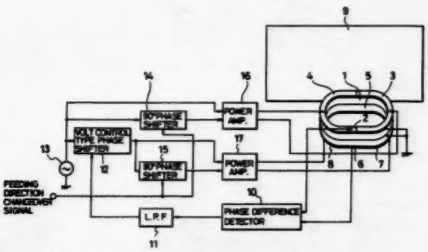
feeding direction and said lateral side registration direction as said hub member is rotated at said small lateral angle to said primary sheet feeding direction, and wherein said rollers are independently rotatable about their own axes, which roller axes are at approximately said same acute small angle to said hub member rotating direction so that said rollers may rotate approximately perpendicular to said primary sheet feeding direction to limit said sheet feeding forces in said lateral side registration direction.

5,065,999

SHEET FEEDING DEVICE UTILIZING VIBRATION WAVES

Kenichi Katsoka; Yoshifumi Nishimoto, both of Yokohama; Masahiko Igaki, and Eiichi Yanagi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 482,918
Claims priority, application Japan, Feb. 28, 1989, 1-47367
Int. Cl.[5] B65H *7/02*
U.S. Cl. 271—265 **17 Claims**



1. A feeding device for a sheet, comprising:

(a) first vibration means so arranged as to frictionally contact the sheet;

(b) second vibration means opposed to said first vibration means across said sheet and so arranged as to frictionally contact said sheet;

(c) first electromechanical conversion means for generating a first travelling vibration wave on said first vibration means in response to a first applied electrical signal;

(d) second electromechanical conversion means for generating a second travelling vibration wave on said second vibration means in response to a second applied electrical signal;

(e) first detecting means for generating a first electrical signal corresponding to the state of said first travelling vibration wave;

(f) second detecting means for generating a second electrical signal corresponding to the state of said second travelling vibration wave; and

(g) changing means for detecting the phase difference between said first and second electrical signals and changing the phase of at least one of said first and second applied electrical signals according to said detected phase difference in order to coincide the phase between the vibration wave generated in the first vibration means and that in the second vibration means.

5,066,000

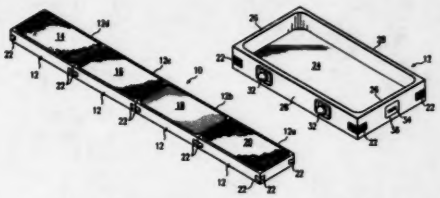
PORTABLE MULTI-SURFACE TRACK

Francis P. Dolan, 2719 Abrams, Dallas, Tex. 75214

Filed Oct. 19, 1990, Ser. No. 600,449
Int. Cl.[5] A63B *1/00, 3/00, 23/04*
U.S. Cl. 272—70 **21 Claims**

1. A multi-surface track comprising:

a plurality of holding sections, each section having a user contacting surface; at least one of said surfaces having a different texture or density than the other of said surfaces; and



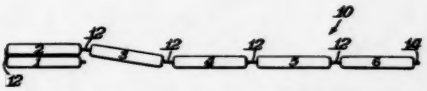
transporting apparatus associated with at least one of the sections for allowing the sections to be readily moved.

5,066,001

PORTABLE, FOLDABLE, ADJUSTABLE, AEROBIC EXERCISE BENCH/STEP/MAT

William T. Wilkinson, P.O. Box 378, Chesapeake City, Md. 21915

Filed Sep. 4, 1990, Ser. No. 577,282
Int. Cl.[5] A63B *6/00*
U.S. Cl. 272—70 **7 Claims**



1. A method of performing an aerobic exercise program with the use of a mat in the form of at least three side by side panels hinged together along their sides to permit the panels to be selectively stacked upon each other to create a step including the step of stacking at least one of the panels on its adjacent panel to create a stack, repeatedly stepping up and down to and from the stacked panels, creating an integral apron with the remaining panel at a height lower than the stacked panels when less than all of the panels are stacked upon each other, varying the height of the step by varying the number of panels which are stacked upon each other, and stepping up and down from the resulting different height steps.

5,066,002

PORTABLE EXERCISE DEVICE

Melinda Cordell, 10965 Fruitland Dr., #310, Studio City, Calif. 91604

Filed Apr. 5, 1990, Ser. No. 505,294
Int. Cl.[5] A63B *23/02*
U.S. Cl. 272—93 **6 Claims**

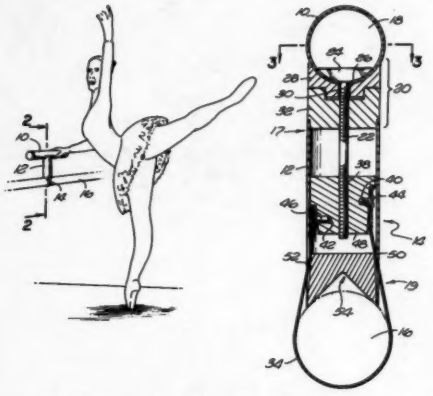
1. A portable exercise device comprising:

support means having a first end and a second end;

mounting means operatively connected to the first end of the

support means for mounting the first end of the support means to a fixed object;

a bar having two ends; and



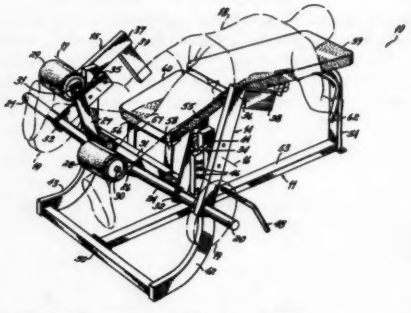
coupling means for releasably securing the second end of the support means to the bar between the ends of the bar.

5,066,003

LEG CURL EXERCISE MACHINE

Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio

Filed Sep. 12, 1990, Ser. No. 581,585
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—134 **27 Claims**



1. A leg curl exercise machine comprising:

a frame;

a platform secured to the frame along a vertical midplane;

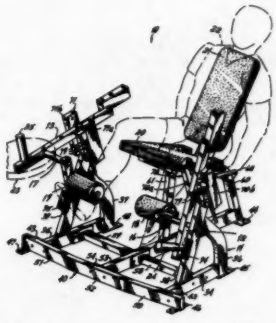
a lever pivotally connected to the frame in front of the platform, the lever adapted to hold at least one removable weight at a forward, lower end thereof and adapted to be pivoted upwardly by the back of the leg of an exerciser supported on the platform during the performance of a leg curl, the lever being pivotal in a plane that is non-parallel with respect to the central vertical plane.

5,066,004

LEG EXTENSION EXERCISE MACHINE

Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Cincinnati, Ohio

Filed Aug. 27, 1990, Ser. No. 573,553
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—134 **19 Claims**



1. A leg extension exercise machine comprising:

a frame;

a seat supported by the frame in alignment with a vertical midplane through the frame;

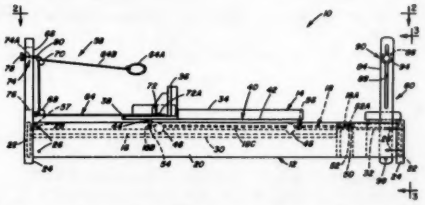
a lever pivotally connected to the frame, a forward end of the lever adapted to hold a removable weight and adapted to be pivotally raised upwardly by the leg of a person supported on the seat, the level being pivotal through a vertical plane of movement which diverges outwardly from the vertical midplane with respect to a forward facing direction of the seat.

5,066,005

ENHANCED CORE MOVEMENT TRAINING BENCH

Thomas W. Luecke, 3785 Moorhead Ave., Boulder, Colo. 80303

Filed Oct. 1, 1990, Ser. No. 591,453
Int. Cl.[5] A63B *21/04*
U.S. Cl. 272—136 **19 Claims**



1. In a core movement training bench including a peripheral frame with opposite ends, a mobile carriage, a pair of tracks mounted on said frame and supporting said carriage for fore-and-aft reciprocal movement between said opposite ends of said frame, and a plurality of elastic resistance elements interconnecting said carriage and one of said ends of said frame, an adjustable arm cord mounting assembly comprising:

(a) a pair of elongated flexible arm cords each having opposite ends;

(b) a pair of anchoring devices disposed on said carriage each for anchoring one of said respective arm cords to said carriage:

(c) a pair of extensions mounted at the other of said ends of said frame, extending generally upwardly from said frame to a desired height above said frame and carriage, and being aligned with opposite sides of said carriage;

(d) a pair of lower guides mounted on either of said other end of said frame or said respective extensions;

(e) a pair of upper guides mounted on said respective extensions in generally vertical spaced relation above said lower guides; and

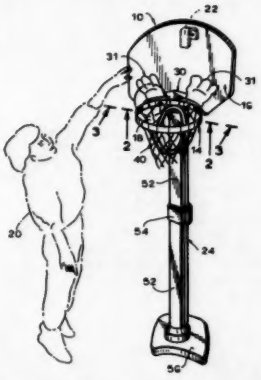
(f) means for adjustably mounting said upper guide to said respective one extension for vertical movement toward and away from said lower guide to vary the height of said upper guide above said frame and carriage, each said arm cord extending generally horizontally from said anchoring device on said carriage to and around one said lower guide, generally vertically from said one lower guide to and around said corresponding one upper guide, and generally horizontally from said one upper guide toward said carriage to one of said ends of said arm cord for gripping by a user on said carriage.

5,066,006

BASKET FOR BASKETBALL-TYPE GAME

John J. Driska, Princeton Junction, N.J., assignor to Azrak-Hamway International Inc., New York, N.Y.

Filed Feb. 7, 1991, Ser. No. 651,737
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 R **13 Claims**



13. A basket for a basketball-like game wherein the player attempts to shoot a projectile downwardly through the opening of a basket, either directly or upon rebound from a backboard, comprising:

(A) a backboard;

(B) a basket defining a generally vertical opening therethrough projecting forwardly of said backboard, said backboard and basket being of reduced scale relative to a regulation-sized basketball backboard and basket;

(C) a slam dunk member having the appearance of at least one hand, said member being pivotally mounted on said basket for movement between a slam dunk orientation, wherein said member at least partially covers said basket opening, and an at rest orientation, wherein said member is spaced from said basket opening to enable passage of the projectile through said basket, said member in said at rest orientation having the appearance of at least one raised hand and in said slam dunk orientation having the appearance of at least one hand which is horizontal or lowered;

(D) moving means having one end portion operatively disposed at least partially in said basket opening and another end portion operatively secured to said member, said moving means being responsive to the passage of the projectile downwardly through said basket for moving said member from said at rest orientation to said slam dunk orientation; and

(E) means biasing said member towards said at rest orientation;

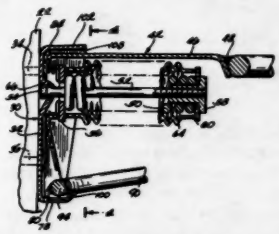
whereby passage of a projectile downwardly through said basket opening is immediately followed by movement of said member from its at rest orientation to its slam dunk orientation so as to simulate the appearance of the projectile being slam dunked through said basket opening by said member.

5,066,007

DIFFERENTIAL BREAKAWAY BASKETBALL GOAL

Michael A. Niver, Waukesha, Wis., assignor to Huffy Corporation, Waukesha, Wis.

Filed Sep. 11, 1989, Ser. No. 405,517
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 R **5 Claims**



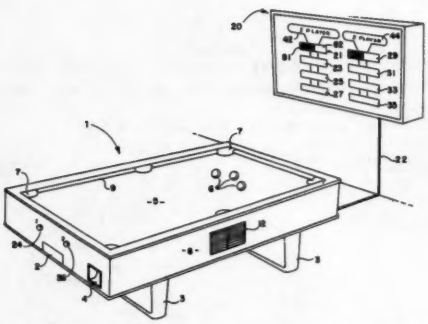
1. A breakaway basketball goal assembly for mounting to a backboard comprising a basketball goal rim, a first mounting plate comprising a generally vertical plate for stationary mounting to the front of said backboard, a second mounting plate including a generally inverted L-shaped member having a vertical leg extending along the front of said first mounting plate and having a generally horizontal leg extending forwardly from said vertical leg and rigidly connected to said rim, biasing means biasing said first and second mounting plates towards each other such that said rim is biased to a normally horizontal position, said first mounting plate having a lower guide tray portion extending forwardly, said vertical leg of said second mounting plate having a lower pivot received in said lower guide tray portion and translatable forwardly and rearwardly therealong to provide a translational pivot, said rim having a forwardly pivoted position responsive to a downward force to said rim, said lower pivot of said second mounting plate being translatable rearwardly along said lower guide tray portion of said first mounting plate, said rim having an upwardly pivoted position responsive to an upward force on said rim, with said lower pivot portion of said second mounting plate being translated forwardly along said lower guide tray portion of said first mounting plate, wherein said rim has a pair of support bars extending downwardly and rearwardly from opposite undersides of said rim and joined at a central support bar rigidly connected to said vertical leg of said second mounting plate, and wherein said lower guide tray portion of said first mounting plate has a central upwardly turned flange of the outer end thereof, and wherein said vertical leg of said second mounting plate has a pair of lower feet spaced along said central support bar on opposite right and left sides of said central upwardly turned flange of said lower guide tray portion of said first mounting plate, said feet translating forwardly and rearwardly through said guide tray portion of said first mounting plate during said pivoting of said rim.

5,066,008

ELECTRONIC VOICE AND CONTROL SYSTEM FOR BILLIARDS

Roberto S. Rivera, Urb. La Margarita Calle B-H-15, Salinas, P.R. 00751

Filed Apr. 5, 1990, Ser. No. 504,834
Int. Cl.[5] A63D *15/00, 15/20*
U.S. Cl. 273—2 7 Claims



1. In a billiard table having a playing surface, a plurality of pockets adjacent said playing surface, conveyance system means for conveying object balls from said pockets to a storage area, and further conveyance system means for conveying a cue ball from said pockets to a cue ball storage area, the improvement comprising a control and scoring system comprising:

(a) a single display including all player indicators for indicating which player is playing, scoring indicator means for all players for displaying a score and "scratch" indicator means for indicating (1) when a "scratch" has occurred and (2) which player has "scratched";

(b) switch means in each pocket closeable when a ball has entered a pocket, each object ball being coated with a magnetic material in a manner such that each object ball has a unique level of magnetic intensity different from a level of magnetic intensity of any other object ball;

(c) switch means in said further conveyance system means closeable when a cue ball is being conveyed thereby;

(d) player switches on said table manually closeable by a player before commencing a turn; and

(e) control means for controlling said system and including:

(i) first means for receiving signals indicating closure of a player switch and sending signals to activate an appropriate player indicator on said display;

(ii) second means for receiving signals indicating closure of said pocket switch means and sending signals to advance an appropriate said scoring indicator means on said display;

(iii) third means for receiving signals indicating closure of said further conveyance system switch means and sending signals to activate an appropriate said "scratch" indicator means on said display;

(f) voice synthesis means activatable by said control means responsive to receipt of preselected signals by said control means for broadcasting audible voice signals; and

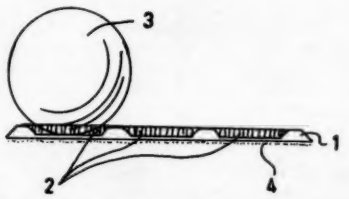
(g) magnetic sensing means for sensing the magnetic intensity of each ball which has entered a pocket and identifying each such ball by its said unique level of magnetic intensity and, responsive to such sensing and identifying, causing activation of an indicator on said display.

5,066,009

CUE BALL SCRATCH INDICATOR

David L. Brady, 6141 E. 31st St., Tucson, Ariz. 85711

Filed Aug. 9, 1990, Ser. No. 565,027
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—14 1 Claim



1. A cue ball scratch indicator apparatus for use on a Pool table wherein said indicator is comprised of a substantially rectangular base member, said base member having a planer lower surface and an upper surface, said upper surface having three inditations therein for retaining a cue ball placed therein, means on said lower surface for attaching said indicator to the upper surface of a pool table, a first of said inditations being labeled "solids", a second of said inditations being labeled "stripes", and a third of said inditations being labeled "choice".

5,066,010

BALL DISPENSING MACHINE

Mark Pingston, 2425 Lone Tree Rd., Milford, Mich. 48380

Filed Nov. 21, 1990, Ser. No. 616,425
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—26 D 16 Claims

1. A ball dispensing machine for use with differently sized balls of a variety of sports, the ball dispensing machine comprising:

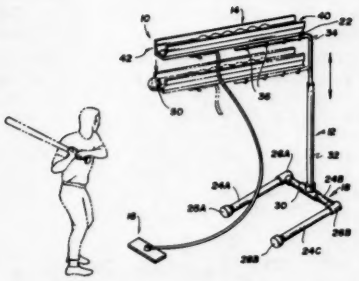
a stand having a base and a stanchion;

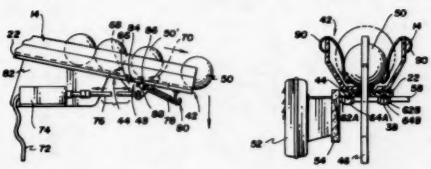
an inverted U-shaped, open top ball carrier mounted on said stanchion, removable guide bar means mounted on each leg of said U-shaped carrier to selectively accommodate differently sized balls, a load end and a discharge end;

said open top being continuous from said load end to said discharge end;

the carrier having means for feeding balls in said carrier toward the discharge end;

gate means for controlling said feeding of balls from said load end to said discharge end; and





a control means for operating said gate means to feed said balls at a desired rate.

5,066,011

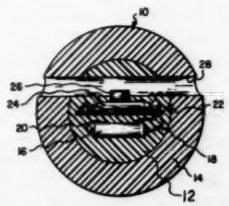
FLASHING LIGHT BALL

Douglas L. Dykstra, 2469 Rocklyn St., Camarillo, Calif. 93010, and Steven L. Herbruck, 355 Dalton, Ventura, Calif. 93003

Filed Apr. 5, 1991, Ser. No. 680,854

Int. Cl.[5] A63H *33/26*; G10H *1/00, 5/04*; A63B *43/06*

U.S. Cl. 273—58 G **11 Claims**



1. A ball with a flashing light comprising:

a solid body constructed of a light transmitting material;

a light source embedded within said body, said light source comprising a flashtube;

an electronic circuit embedded within said body, said electronic circuit being connected to said flashtube; and

a battery embedded within said body, said battery being connected to said electronic circuit, said electronic circuit preventing activation of said flashtube with said body not incurring any physical jolting force, said electronic circuit causing momentary activation of said flashtube with energy being supplied from said battery when said body incurs a jolting force such as what occurs when said body is thrown against an exterior object.

5,066,012

POLAR LIGHTED BALL

Steven P. Stark, 18355 Yorkshire, Prior Lake, Minn. 55372

Filed Feb. 11, 1991, Ser. No. 653,696

Int. Cl.[5] A63B *43/06*

U.S. Cl. 273—65 EF **20 Claims**

1. A recreational ball comprising:

(i) a resiliently compressible ball body having an axis about which said ball body is substantially symmetrical and having opposing polar regions at opposite ends of said axis,

(ii) a light passage means extending axially through each said polar region, and

(iii) a lighting assembly recessed axially inward of each said polar region for projecting a light beam axially outward through said light passage means thereof so that a receiving player is able to judge the motion of the ball by observing the light beams emitted from the polar regions.

5,066,013

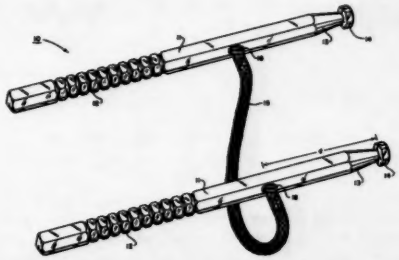
KUBOTAI RESTRAINT DEVICE HAVING TWO BATONS BOUND TOGETHER BY A CORD AT POINTS SPACED FROM THE ENDS OF THE BATONS

Takayuki Kubota, 1436 Ardmore Ave., Glendale, Calif. 91202

Filed Jun. 12, 1990, Ser. No. 536,969

Int. Cl.[5] F41B *15/02*

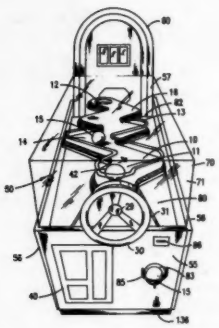
U.S. Cl. 273—84 R **5 Claims**



1. A device for restraining a person by applying it to the wrist or other part on a limb comprising a woven nylon cord and two batons, each baton having a handle at one end, said batons being connected by said woven nylon cord protruding from each baton at a point four inches from the end opposite said handle thereof, leaving only a majority of said baton length from the end of said handle to said cord for leverage in applying tension to said cord, said cord being of a length between batons approximately equal to the circumference of the

wrist of an average male adult, and the end of each baton opposite the handle thereof being shaped to have a monolithic flange section that is frustum of a cone with a base thereof contiguous with said handle.

5,066,014
SIDEWINDER AMUSEMENT GAME
Michael J. Dobson, Mississauga, Canada, assignor to Bob's Space Racers, Inc., Daytona Beach, Fla.
Continuation-in-part of Ser. No. 617,626, Nov. 26, 1990. This application May 9, 1991, Ser. No. 697,886
Int. Cl.[5] A63F *7/02, 07/28, 07/38*
U.S. Cl. 273—110 **20 Claims**



1. A tiltable table apparatus for a ball rolling game comprising

a bottom panel joining a pair of side panels, a front panel and a back panel,

a table supporting means attached at a bottom end to the bottom panel and at a top end pivotally to a planar tiltable table,

the tiltable table having an elongated zig-zag pattern containing a single track for a ball, an upper portion of the track having side support means for preventing the ball from leaving the track, and a lower portion of the track being devoid of side support means so that the ball can fall from the track to the bottom panel if the table is improperly controlled by a game player,

an object target located in the lower portion of the track,

the table being partially rotated about a central longitudinal axis by manipulation of a control means by a game player, the table having a downward slope from its upper portion to its lower portion, and

the control means attached to a connecting means engaged to the table.

5,066,015
BOARD GAME APPARATUS AND METHOD OF PLAYING
Terry Sumrall, 5953 Hopper St., Houston, Tex. 77016
Filed Sep. 24, 1990, Ser. No. 587,269
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—243 **2 Claims**

1. A board game based on a railroading theme wherein the object is to be the first player to assemble the necessary components of a complete railroad train, the game comprising:

a gameboard having a rectangular playing surface with an array of trackage arranged about its periphery representing a railroad marshalling yard and defining a path of adjacent spaces including a signal block space, a communication space, and a switch space,

a plurality of spaced-apart and color-coded starting locations and storage locations along said trackage for related playing pieces,

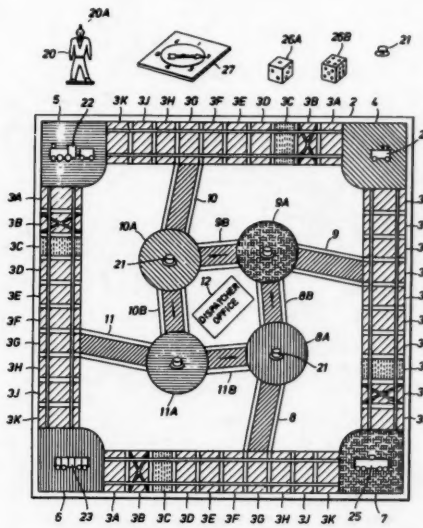
a plurality of spaced-apart depot storage locations disposed inwardly from said peripheral trackage and each interconnected by additional sections of trackage and each interconnected to a switch space of said peripherpheral trackage,

a plurality of movable employee playing pieces each formed to resemble a railroad employee having the initial status of fireman and each distinctly color-coded to relate to a preselected one of the players of said game and capable of moving on said peripheral and additional sections of trackage,

a first plurality of train playing pieces each representative of a locomotive which are initially positioned at one of said storage locations and each color-coded to relate to a preselected one of said players,

a second plurality of train playing pieces each representative of a caboose which are initially positioned at one of said storage locations and each color-coded to relate to a preselected one of said players,

a third plurality of train playing pieces each representative of different types of railroad rolling stock with each type initially positioned at one of said storage locations respectively and each one of each type color-coded to relate to a preselected one of said players,



a plurality of headdress playing pieces each formed to resemble an article of headdress representative of the status of railroad engineer each initially position at one of said depot storage locations and each color-coded to relate to a preselected one of said players,

said headdress playing pieces configured to be releasably received on said employee playing pieces to represent the elevation in employee status from a "fireman" which cannot collect said train playing pieces to an "engineer" which can collect said train playing pieces,

chance means for randomly establishing the extent of movement of said employee playing pieces along said trackage, and

a set of message cards corresponding to said communication spaces on said peripheral trackage which represent various massages sent from a yard dispatcher to a player and instructing the player to move their employee playing piece ahead or back a number of spaces or to advance it to a storage location.

5,066,016

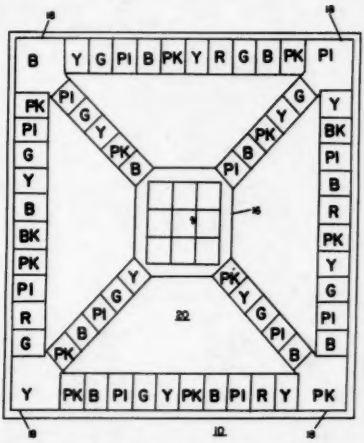
METHOD OF PLAYING A BOX-OFFICE MOVIE GAME

Mark D. O'Neill, 11 Monmouth Rd., Oceanport, N.J. 07757

Continuation of Ser. No. 462,146, Jan. 8, 1990, abandoned. This application Dec. 6, 1990, Ser. No. 622,974

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—249 6 Claims



1. A method of playing a box-office movie identification game comprising the steps of:

providing a playing board;

providing a plurality of playing pieces;

providing means directing movement of said pieces to predetermined positions around said board in accordance with player actuations thereof;

providing a set of quotation cards for player identification of specific, box-office movie films;

providing a set of acting cards for player impersonation of performers in specific, box-office movie film roles;

providing on said board a first plurality of spaces that call for the reading to a player of a quotation from a specific theater-released feature film, and a second plurality of spaces that call for the impersonation by the player of a performer in a specific theater-released feature film role;

wherein each quotation card contains a quotation spoken in a theater-released feature film of a category of "Comedy", "Action & Adventure", "Drama & Musicals", "Mystery & Horror", and "Science Fiction & Fantasy", which are to be read to the player for the player to identify the film from which the quotations comes; and

wherein each acting card contains the names of several actors and actresses and several of the theater-released feature films in which they each have performed players in turn moving their playing pieces along the board according to said movement directing means;

a player drawing an acting card when his playing piece lands on one of said second plurality of spaces;

said player selecting one of the named actors and actresses on said acting card and selecting one of the listed films on said acting card which the selected actor or actress performed in;

said player determining which actor or actress and which film to select by determining which actor or actress and the film the player is most familiar with and most skilled at impersonating;

said player performing an impersonation of the selected actor's or actresse's role in the selected film for the other players to identify.

5,066,017

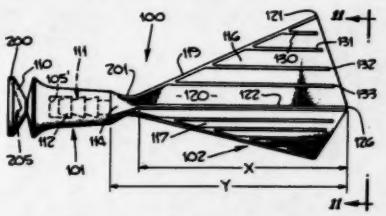
SUCTION CUP PROJECTILE FOR USE IN PADDLE GAME

Jeffrey Kurland, Topsail, #1, Marina del Rey, Calif. 90291

Continuation-in-part of Ser. No. 483,863, Feb. 23, 1990, abandoned, Continuation-in-part of Ser. No. 370,446, Jun. 23, 1989, abandoned. This application Nov. 14, 1990, Ser. No. 614,840

Int. Cl.[5] A63B *65/02*

U.S. Cl. 273—344 14 Claims



1. A projectile for use in a recreational game having a wing portion and a suction cup portion, said suction cup portion having a generally cylindrically main body portion with a suction cup at one end and said wing portion extending from the other end, said wing portion having a plurality of spaced wings providing airfoils, each of said wings radially extending from and integral with an elongated main rib portion coincident with the central axis of said cylindrical portion and extending therefrom, each of said wings having a generally flat planar body portion with an outer rib extending from said cylindrical portion to the terminal end of its respective wing and at an angle to said main rib portion, and a plurality of spaced ribs extending generally parallel to said main rib portion along each of said wings.

5,066,018

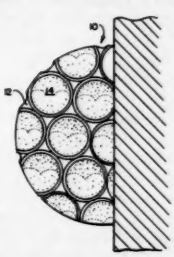
DEFORMABLE SPHERE WITH A SUCTION CUP EXTERIOR

Dean S. Hinton, 10400 Masters Terrace, Potomac, Md. 20854

Filed Oct. 16, 1990, Ser. No. 597,038

Int. Cl.[5] A63B *43/00, 65/00*

U.S. Cl. 273—344 8 Claims



1. A deformable sphere with a suction cup exterior comprising:

a) a deformable envelope, configured as a sphere;

b) a plurality of flexible suction cups supported upon the exterior of said sphere such that said suction cups extend radially outwardly thereof, with the edges of said suction cups positioned as closely as possible upon the sphere exterior, and

c) particulate aggregate loosely supported within said sphere, such that a substantially planar surface is assumed by the exterior of said sphere as said suction cups engage a supporting surface.

5,066,019

THERMALLY-EMISSIVE, WEAPONRY TARGET, TRAINING AID OR ARC DESIGNATOR STRUCTURE

William R. Dean, Chandlers Ford, and John H. Waters, Farnham, both of England, assignors to Hitchcox Targets Limited, Hampshire, England

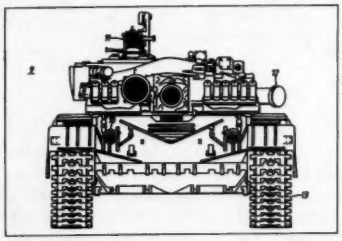
PCT No. PCT/GB89/00030, § 371 Date Jul. 30, 1990, § 102(e) Date Jul. 30, 1990, PCT Pub. No. WO89/07232, PCT Pub. Date Aug. 10, 1989

PCT Filed Feb. 1, 1989, Ser. No. 543,811

Claims priority, application United Kingdom, Feb. 1, 1988, 8802140

Int. Cl.[5] F41J *5/08*

U.S. Cl. 273—348.1 **23 Claims**



1. A thermally-emissive structure comprising a surface, the surface being, in a region or regions intended to define an area to be detected by a thermal imager, darkened relatively to other regions thereof by high heat emissivity material; heating means for heating said high heat emissivity material above ambient temperature by a heating element in the form of a plastic film having an electrically-conductive metallic coating of substantially uniform electrical resistance; a flexible carrier member and a rigid backing member, said plastic film with its coating being joined to said flexible carrier member which is itself joined to said rigid backing member, said structure providing a relatively high thermal mass wherein said area is formed by an image defined by darkened regions over said area to achieve the desired thermal image when an electrical current is passed through said coating.

5,066,020

DART CARD GAME BOARD

Albert D. Trudeau, 31514 Hipshot Dr., Castaic, Calif. 91384

Filed Oct. 15, 1990, Ser. No. 597,552

Int. Cl.[5] F41J *3/00;* **A63B** *65/02*

U.S. Cl. 273—408 **1 Claim**

1. A method of playing a dart card game comprising the steps of,

providing a playing board, with the playing board demarcated by a first, second, third, and fourth coloration which defines a club suit, the second coloration defines a heart suit, the third coloration defines a diamond suit, and the fourth coloration defines a spade suit, and

providing a first, second, third, and fourth set of darts, wherein each set of darts is defined by five individual darts, wherein the first set of darts defines the club designation, the second set of darts defines the heart designation, the third set of darts defines the diamond designation, and the fourth set of darts defines the spade designation, and

the playing board including an outer circular target array, including spaced adjacent triangular targets of contrasting colors and suit designations, and

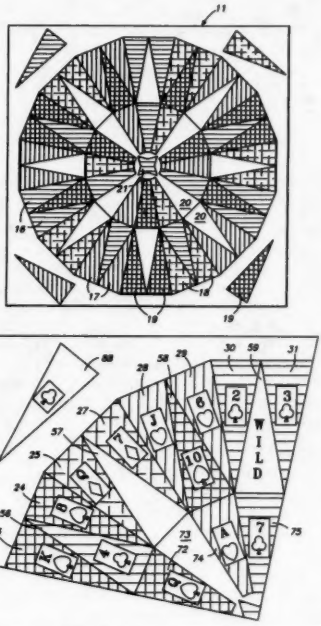
an inner circular array of triangular target zones defining contrasting colorations and suit designations, and

a central bull's-eye target, wherein the outer and inner circular array of triangular targets define fifty-two playing cards of a bridge-type playing deck, and

including equally spaced blank triangular target zones, and

defining equally spaced "wild" target zones, and

providing each player five darts from the first, second, third, and fourth set of darts and directing each player to impact a triangular target zone corresponding to a suit designation of each respective dart, wherein each suit deck designation includes the club, heart, diamond, and spade designation to assemble poker arrays of card designations by



impacting a triangular target zone to correspond to the desired poker type array, and

randomly providing each player of a plurality of players with said five darts of the sets of darts, and

directing each player to direct said five darts at the playing board to obtain a poker hand, and

awarding a winning player with a poker hand of greatest value in a hierarchy of poker.

5,066,021

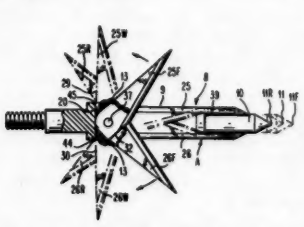
ARROW SYSTEM

Paul V. DeLucia, Rt. 82 R.D. 6 Box 12, Hopewell Junction, N.Y. 12533

Division of Ser. No. 205,077, Jun. 10, 1988. This application Feb. 8, 1990, Ser. No. 477,335

Int. Cl.[5] F42B *6/08*

U.S. Cl. 273—421 **19 Claims**



1. A hunting arrowhead adapted to be attached to the end of an arrow shaft comprising:

(a) a hollow elongated body having an outer wall with a first axial slit;

(b) a slide pin slidably received in said hollow elongated body having a second axial slit aligned with said first axial slit in said hollow elongated body; and

(c) at least one blade rotatively affixed within said outer wall of said hollow elongated body to said slide pin and adapted to rotate outwardly through said first and second axial slits when said slide pin moves within said hollow elongated body.

5,066,022

SWIM GOGGLE SEALANT

Richard H. Harrington, 631 Third St., Ann Arbor, Mich. 48103

Filed Feb. 23, 1990, Ser. No. 485,110

Int. Cl.[5] F16J *15/10*

U.S. Cl. 277—1 7 Claims

1. As a new use a viscous silicone base non-toxic, non-melting, non-irritating highly water resistant non-smearable, non-creep sealant applied to the skin seal of swimmer eye wear.

5,066,023

IONIZATION SENSOR

Thomas T. Ma, South Woodham Ferrers, England, assignor to Ford Motor Company, Dearborn, Mich.

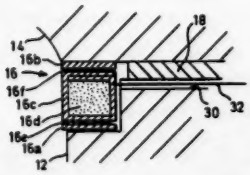
PCT No. PCT/GB88/00865, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO89/03520, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 14, 1988, Ser. No. 473,969

Claims priority, application United Kingdom, Oct. 16, 1987, 8724351

Int. Cl.[5] G01L *22/23;* F02F *11/00;* F16J *15/06*

U.S. Cl. 277—2 3 Claims



1. A gasket for sealing between an engine block and a cylinder head, characterised by an electrically conductive surface portion (16c) which, in use, is electrically insulated from the cylinder head (14) and from the engine block (12) so that it may serve as an electrode of an ionisation sensor, said gasket (16) formed as a ring of five layer sandwich construction, comprising two outer layers (16*a*, 16*b*) of soft metal capable of deformation under pressure to effect a gas tight seal with the block and the cylinder head, a central core (16c) of electrically conductive material to serve as an ionisation electrode and two layers of ceramic material (16*e*, 16*f*) insulating the central core from the outer two layers.

5,066,024

BRUSH-TYPE SEAL

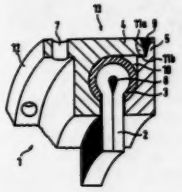
Lothar Reisinger, Dachau; Dieter Hagg, Karlsfeld; Werner Wenzl, and Klaus Walther, both of Munich, all of Fed. Rep. of Germany, assignors to MTU Motoren- Und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 302,990, Jan. 30, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 581,150

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1988, 3802653

Int. Cl.[5] F16J *15/447*

U.S. Cl. 277—53 10 Claims



1. A brush-type seal comprising:

a wire bundle, which has a mid-portion bent around a core ring in a U-shape;

a ring-shaped tube having a continuous slot on a radially inwardly facing surface to surround the bent around mid portion of the wire bundle;

wherein the tube is tensioned on opposite axial sides by two support rings joined together to form a housing, said two support rings being joined by a process that applies a required clamping force to the wire bundle via the joined support rings and the tube; and

wherein the process that joins the support rings together is welding or soldering.

5,066,025

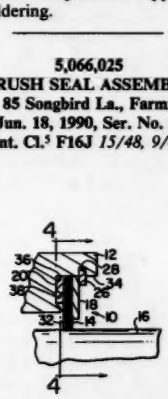
BRUSH SEAL ASSEMBLY

Paul R. Hanrahan, 85 Songbird La., Farmington, Conn. 06032

Filed Jun. 18, 1990, Ser. No. 539,241

Int. Cl.[5] F16J *15/48, 9/00*

U.S. Cl. 277—53 2 Claims



1. A brush seal assembly comprising:

a rotatable cylindrical inner member having a known direction of rotation and a cylindrical seal surface;

a brush seal having an annular short side plate, an annular long side plate and a plurality of bristles secured therebetween, said bristles extending inwardly and inclined to the radial direction;

a hollow cylindrical support structure concentrically surrounding said shaft;

said support structure having an inside circular surface of a diameter commensurate with the outside diameter of said brush seal, for receiving said brush seal;

an axially facing shoulder extending radially inwardly from said inside circular surface, and having a recessed surface therein from said inside circular surface a distance greater than the radial dimension of said short side, but less than the radial dimension of said long side;

a retention ring;

a retention ring groove for receiving said retention ring in said inside circular surface a distance from said recessed surface greater than the thickness of said brush seal, and also located a distance from said shoulder less than the thickness of said brush seal; and

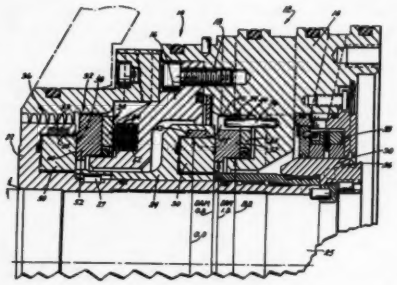
said bristles inclined in the direction of cylindrical inner member rotation when said brush seal is installed with said short side in said recess.

5,066,026

GAS FACE SEAL

John A. Heck, Timonium, and H. Randall Wilhelm, Baltimore, both of Md., assignors to Kaydon Corporation, Muskegon, Mich.

Filed Jun. 11, 1990, Ser. No. 535,906
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—96.1 **20 Claims**



1. A gas face seal for sealing the interface between a rotating shaft and a housing, said seal comprising:

an annular shoulder having a generally planar, radially extending face;

retainer means connected to the shoulder for retaining the shoulder on the shaft for rotation therewith;

an annular face seal ring having a radially extending generally planar seal face;

lock means engaging the face seal ring for locking the face seal ring to the housing while permitting axial motion towards and away from the face of the shoulder; and

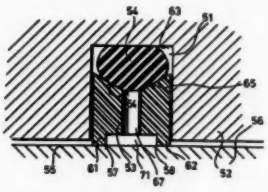
resilient means engaging said face seal ring for resiliently biasing said face seal ring towards said shoulder, one of said radially extending face and said seal face defining a set of a plurality of spaced, circumferentially extending inclined recesses, each of said recesses having a circumferentially inclined base angled axially inwardly in the direction of relative rotation of said one of said faces to form a smooth transition therewith, said recesses being shrouded and separated by unrelieved planar surfaces and wherein said inclined recesses each have an angle of inclination "a" greater than 0 and approximately 0.2° or less and a maximum depth within the range of 0.0002 inches to 0.0008 inches, and wherein each of said recesses has a circumferential length "X" and said recesses are separated by an unrelieved surface having a circumferential length "Y" and wherein the ratio $X/(X+Y)$ is within the range of 0.2 to 1.0 and wherein each of said recesses is shrouded radially inwardly, radially outwardly and circumferentially at one side of the recess.

5,066,027

SEALING RING APPARATUS

Roy Edlund, Stuttgart, Fed. Rep. of Germany, assignor to Busak + Luyken GmbH & Co., Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 285,785, Dec. 16, 1988, abandoned.
This application Jul. 3, 1990, Ser. No. 547,374
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743726
Int. Cl.[5] F16J *15/10, 15/32*
U.S. Cl. 277—165 **3 Claims**



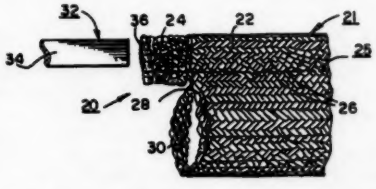
1. Structure for sealing a gap between two concentric machine parts which are arranged to move relative to each other, the first machine part being provided with a groove while the second machine part includes a plain contact surface arranged opposite said groove, a sealing ring made of a tough-elastic plastic material adapted to fit in the groove of the first machine part, with a first circumferential surface facing an annular bottom surface the groove and a second circumferential surface facing the contact surface of the second machine part, the second circumferential surface being provided with opposed ends and an annular recess therebetween defining spaced sealing edges bearing upon the contact surface of the second machine part, the surface facing the groove bottom surface being provided with its own annular groove, a stressing ring of a rubber-elastic material, arranged in the annular groove between the sealing ring and the groove bottom surface of the first machine part, the sealing ring groove being substantially trapezoidal in cross-section with inclined flanks so that due to an increase in pressure the stressing ring rides up one of the inclined flanks, moving upwardly to load the sealing ring in the radial direction sealing one of the spaced sealing edges, the sealing ring comprising further at least one radial bore interconnecting the recess between the sealing edges and the bottom of the annular groove, said sealing ring also being of symmetrical design, relative to its center axis in the radial direction.

5,066,028

GASKET ASSEMBLY

Thomas L. Weil, Elverson, Pa., assignor to Davlyn Manufacturing Co., Spring City, Pa.

Division of Ser. No. 358,722, May 30, 1989, Pat. No. 4,979,280.
This application Oct. 31, 1990, Ser. No. 606,237
Int. Cl.[5] F16J *15/00*
U.S. Cl. 277—181 **12 Claims**



1. A gasket assembly formed by the method comprising the steps of:

securing together in a flexible, elongated gasket subassem-

bly, a first, elongated, braided flexible tube and an adjoining, second, elongated flexible member, the braid of the first tube permitting an elongation of the first tube under tension, the second member being formed of metal wire fabric, the adjoining first tube and second member being secured to one another along their lengths in a manner such that when the subassembly is tensioned sufficiently to elongate the second member as fully as the fabric of the metal wire permits, the first tube is only partially stretched to a maximum elongation permitted by the braid;

threading the elongated, flexible subassembly onto an elongated, substantially rigid frame member;

tensioning at least the second member on the frame member; and

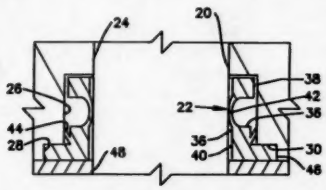
securing portions of the tensioned second member to the frame member, thereby fixing the subassembly under tension to the frame member.

5,066,029

ANNULAR SEALING APPARATUS

David Gill, Otley, England, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Oct. 26, 1990, Ser. No. 604,608
Int. Cl.[5] F16J *15/48, 15/56;* E21B *33/126*
U.S. Cl. 277—236 **10 Claims**



1. An annular sealing apparatus for sealing across an annulus between a first member and a second member with one of said members having a cylindrical sealing surface comprising

an annular metal seal body having a pair of spaced apart annular flanges and an annular arch extending between said flanges and toward said cylindrical sealing surface of said one of said members,

said arch being relatively thick adjacent said flanges and including a thin portion that is progressively thinner toward its apex so that an area of sealing contact with said cylindrical surface of said one of said members is in the thin portion of the arch, and

said arch having a shape which has a relatively small radial height toward the sealing surface with respect to its axial length,

said annular metal seal body having sealing engagement means for sealing engagement with a portion of the other of said members.

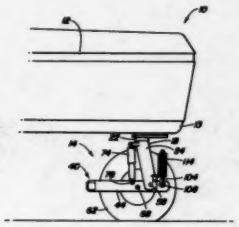
5,066,030

CUSHIONED WHEEL ASSEMBLY FOR A SPRAYER

William A. Brett, and Richard D. Zaun, both of Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 30, 1990, Ser. No. 607,013
Int. Cl.[5] B60G *7/00*
U.S. Cl. 280—92 **10 Claims**

1. In a high crop spray vehicle having a vehicle frame adapted for forward movement over a field, an upright steering yoke supported from the vehicle frame and extending downwardly therefrom, a U-shaped and generally horizontal pivoting frame having side legs and a connecting portion extending between the side legs, means for rockably connecting the pivoting side legs to the lower end of the steering yoke for rocking of the pivoting frame about a first axis, a ground wheel carried between the side legs of the U-shaped frame for rotation about a rotational axis offset in a first fore-and-aft direction from the first axis, first and second shock absorbers extending downwardly from the upper end of the steering yoke to pivotal connections with each of the side legs at locations offset in the fore-and-aft direction from the rotational axis, first and second spring abutment brackets fixed to the lower end of the steering yoke on opposite sides of the wheel, first and second tension



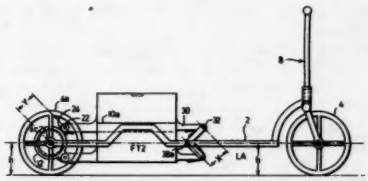
links connected to the side legs on the fore-and-aft side of the first axis opposite that of the rotational axis, the tension links extending upwardly through the spring abutment bracket on the corresponding side of the yoke, and a spring compressed between the upper end of each of the links and the corresponding spring abutment bracket to thereby provide shock-absorbed cushioning for the wheel.

5,066,031

SELF-PROPELLED VEHICLE

Isaac Rinkewich, 48-22 Garden View Ter., Hightstown, N.J. 08520

Filed May 25, 1990, Ser. No. 528,398
Int. Cl.[5] B62M *1/04*
U.S. Cl. 280—221 **8 Claims**



1. A self-propelled vehicle, comprising:

a frame having a wheel at one end, and a pair of wheels at the opposite end connected for rotation together by a common axle;

a pair of foot treadles mounted in side-by-side relation; and

an overrunning clutch for each of said foot treadles, each overrunning clutch having a driving member coupled to said foot treadle, and a driven member coupled to said common axle of said pair of wheels for driving the vehicle;

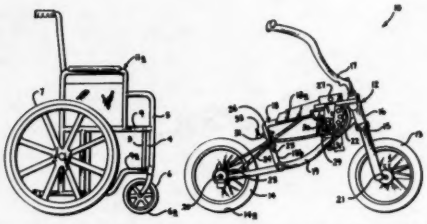
each of said treadles being mounted to the frame by a four-link parallelogram having first and second arms at the opposite ends of the respective foot treadle for retaining the respective foot treadle substantially parallel to the longitudinal axis of the vehicle frame as the foot treadle is driven downwardly by the operator's foot to propel the vehicle.

5,066,032

WHEEL CHAIR CYCLE APPARATUS

Charles R. Van Vooren, 2409 Adrian St., and Leslie W. Austin, 540 Strathaven Ct., both of Turlock, Calif. 95380

Filed Sep. 7, 1990, Ser. No. 578,685
Int. Cl.[5] B62M *1/02*
U.S. Cl. 280—304.1 **5 Claims**



1. A wheel chair cycle apparatus comprising, in combination,

a wheel chair assembly, wherein the wheel chair assembly includes a framework, including a plurality of spaced vertical frame rails, with each frame rail including an upper and lower horizontal frame rail, and

the spaced vertical frame rails including a cross brace positioned rearwardly of the spaced vertical frame rails between the upper and lower horizontal frame rails, and the cross brace includes a yoke, with the yoke positioned rearwardly of the spaced vertical frame rails within the framework of the wheel chair assembly, and

further including a bicycle member, wherein the bicycle member includes a forward bicycle wheel and a rear bicycle wheel, and

a bicycle framework, wherein the bicycle framework includes a lower arcuate frame bar and an "L" shaped upper frame bar, with the upper frame bar including a horizontal bar member, and a vertical bar member, with the vertical bar member intersecting the lower arcuate frame bar, and

mounting means integrally secured to the vertical bar member of the bicycle for securement to the yoke of the wheelchair in order to fasten the bicycle member to the wheel chair assembly, and

the bicycle framework including a frame neck tube, with the frame neck tube integrally secured to a forward terminal end of the horizontal bar and a forward terminal end of the lower arcuate frame bar, and

a forward bicycle wheel including a forward axle, with the forward axle mounted to a forward wheel support tube, and the forward wheel support tube rotatably mounted within the frame neck tube, and a handle bar member mounted to the forward wheel support tube within the frame neck tube, and

a rear bicycle wheel including a rear axle mounted to the lower arcuate frame bar at rear terminal end of the lower arcuate frame bar, and

motive means rotatably mounted to the horizontal bar to effect rotation of the rear bicycle wheel.

5,066,033

METHOD AND APPARATUS FOR LAUNCHING A SMALL BOAT USING ROPE RETENTION GUIDE

Lawrence E. Kolstad, Hopkins, and Robert R. V. Fumanti, Hibbing, both of Minn., assignors to L. & B. Diversified Products, Hopkins, Minn.

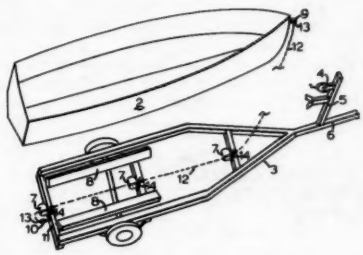
Filed May 29, 1990, Ser. No. 529,387
Int. Cl.[5] B60P *3/071, 3/10*
U.S. Cl. 280—414.1 **6 Claims**

1. A method for launching a boat from a trailer having means for easing movement of the boat back and forth thereon including the following steps:

attaching one end of a launching rope of a predetermined length to an eye at the bow of the boat and a second end of the launching rope to an eye bolt at the rear of the trailer;

releasably securing the launching rope to guide means spaced along the length of the trailer at predetermined locations;

backing the trailer to a position for launching the boat and detaching any remaining connections between the boat and trailer except for the launching rope;



launching the boat from the trailer while the launching rope is sequentially released from the guide means spaced along the trailer;

maintaining the connection of the boat to the trailer with the launching rope while pulling the trailer forward until the boat reaches the beach; and

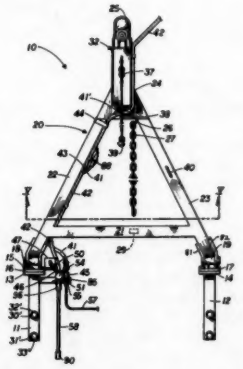
detaching the launching rope from the eye bolt and securing it relative to the beach thereby permitting removal of the trailer from the launching area.

5,066,034

CAR TOWING APPARATUS WITH SURGE BRAKE

Larrey Carr, Lodi, Calif., assignor to Gene Heiden, a part interest

Filed Mar. 19, 1990, Ser. No. 495,086
Int. Cl.[5] B60T *7/20*
U.S. Cl. 280—428 **13 Claims**



1. A car towing apparatus for connection to a towing vehicle for towing a driveable vehicle, having its own braking system which comprises a master brake cylinder fluidly coupled to spaced wheel cylinders, which apparatus permits said driveable vehicle's braking system to be actuated remotely during a tow and by the driver when the vehicle is being driven, said apparatus comprising:

a frame;

a pair of spaced elongated towed vehicle engaging supports

on said frame adapted to be coupled to said towed driveable vehicle;

surge brake means on said frame adapted to emit a flow of hydraulic fluid upon sudden stop of said frame when said frame is being towed;

brake system actuating means on said driveable vehicle fluidly connected between both said surge brake means and the master cylinder of the driveable vehicle braking system for receiving fluid from both said surge brake means and from said master cylinder for distribution of said fluid to said wheel cylinders whereby,

when said driveable vehicle is being driven and the driver applies the brake pedal, fluid from said master cylinder flows to said actuating means where said fluid is distributed to said wheel cylinders to stop the vehicle, and,

when said driveable vehicle is being towed and said frame is stopped suddenly, said surge brake means actuates to deliver fluid to said actuating means which in turn distributes said fluid to said wheel cylinders to stop the vehicle.

5,066,035

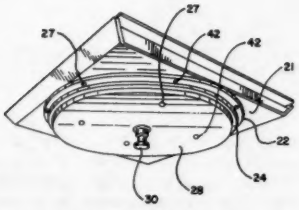
TRAILER BEARING PLATE FOR FIFTH WHEEL

Leonidas Athans, 463 Witshire Ln., and George C. Athans, 740 St. Andrews Ln., both of Crystal Lake, Ill. 60014

Filed Apr. 18, 1990, Ser. No. 511,391

Int. Cl.[5] B62D *53/06*

U.S. Cl. 280—441.1 **6 Claims**



1. An assembly for coupling a truck tractor to a semi-trailer, the assembly comprising:

an upwardly facing tractor bearing plate; and

a trailer bearing plate assembly adapted to securely attach to an underside of said trailer, said trailer bearing plate assembly including a downwardly facing disk for engagement with said upwardly facing tractor bearing plate and having a peripheral flanged edge, said trailer bearing plate assembly further including a ring secured to an underside of said trailer, said ring having an inwardly directed collar retainingly extending only about said disk peripheral flanged edge to permit said tractor bearing plate to rotate independent of said ring.

5,066,036

SKI BINDING

Timothy C. Broughton, 135 Crestview La., Park City, Utah 84060

Filed Mar. 19, 1990, Ser. No. 496,436

Int. Cl.[5] A63C *9/86*

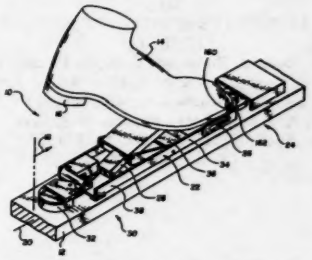
U.S. Cl. 280—615 **23 Claims**

23. A ski binding system for attaching a boot to an elongate ski, with longitudinal axis, comprising:

a base plate having forward and rear ends, said base plate releasably joined to the upper surface of a ski for safety release therefrom by excessive force between said boot and said ski while remaining attached to said boot;

pivotable attachment assembly means mounted to said base plate and pivotably attachable to said boot at one of a location at said ball of a skier's foot and rearward thereof, forward of the heel of said foot, to selectively secure and release said boot relative to said base plate, said attachment assembly means pivotable about a transverse axis and extendable for downwardly biased upward movement of said boot rearward of the boot toe end relative to said base plate;

bail means to restrict the transverse and upward movement of said toe end relative to said base plate; and



means for releasably joining said forward and rear ends of said base plate to said ski whereby said base plate forward end is released transversely from said ski and said base plate rear end is released upwardly from said ski.

5,066,037

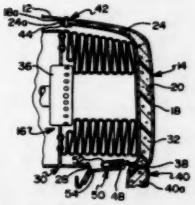
INSTRUMENT PANEL WITH AIRBAG DEPLOYMENT DOOR

Steven Castrigno, Somersworth; Scott E. Rafferty; Lawrence R. Nichols, both of Dover, all of N.H., and Claude Bemis, York, Me., assignors to Davidson Textron Inc., Dover, N.H.

Filed Aug. 22, 1990, Ser. No. 570,787

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—732 **8 Claims**



1. A door assembly for concealing an opening (**12***a*) to an airbag restraint system (**16**) including an airbag, a housing (**30**) for the airbag, a gas generator located in the housing for supplying gas to the airbag in response to vehicle impact, said door assembly comprising:

an outer member (**18**); a foam member (**22**) backing said outer member, and an inner member (**24**) backing said foam member formed from deformable metal and means (**44**) for joining said foam member and outer member for closing the opening prior to deployment of an airbag into a passenger compartment of a vehicle;

an interior trim member (**10**) surrounding the opening;

hinge means (**42**) integrally formed on said inner member and connected to said interior trim member;

releasable latch means (**50**) for receiving and connecting only said inner member to said housing for holding said inner member within said interior trim member to close said opening with said outer member and said foam member connected to said inner member and closing said opening;

said releasable latch means opening at substantially the same release force throughout the opening temperature range of the vehicle when said airbag inflates to cause said hinge means to deform so as to separate said inner member, said foam member and said outer member from said opening

for deployment of the airbag therethrough and into a passenger compartment of a vehicle.

5,066,038

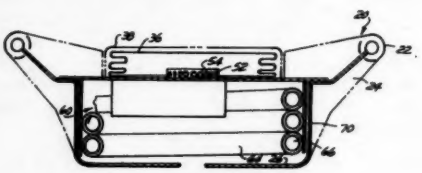
DRIVER SIDE HYBRID INFLATOR AND AIR BAG MODULE

Richard L. Frantom, Richmond; David A. Pickett, Roseville; William E. Rogerson, Rochester, all of Mich.; James Rose, Fairfax, and Robert Schubert, Sterling, both of Va., assignors to Bendix Atlantic Inflator Company, Troy, Mich.

Filed Jul. 31, 1990, Ser. No. 560,937

Int. Cl.[5] B60R *21/26*

U.S. Cl. 200—737 **11 Claims**



1. A device for inflating an air bad adapted to be mounted to a steering wheel comprising:

a pressure vessel formed of a length of narrow tubing for storing a quantity of inert gas under pressure and seal means for enclosing a first end of the tubing;

activation means responsive to a control signal indicative of a vehicular crash situation for causing the seal means to open to permit the pressurized gas to inflate an air bag and

manifold means for communicating released gas to an air bag wherein the tubing is formed as a coil and wherein the coil and activation means are disposed within a central hub portion of the steering wheel.

5,066,039

AIR BAG DEVICE FOR PROTECTING A VEHICLE OCCUPANT

Kazuaki Shitanoki; Masaaki Kawaguchi, and Saburo Kobayashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1989, Ser. No. 339,047

Claims priority, application Japan, Apr. 20, 1988, 63-95706

Int. Cl.[5] B60R *21/26*

U.S. Cl. 280—741 **7 Claims**

1. An air bag device for protecting a vehicle occupant, comprising:

a gas generating agent for generating gas when burned;

an igniter for igniting said gas generating agent;

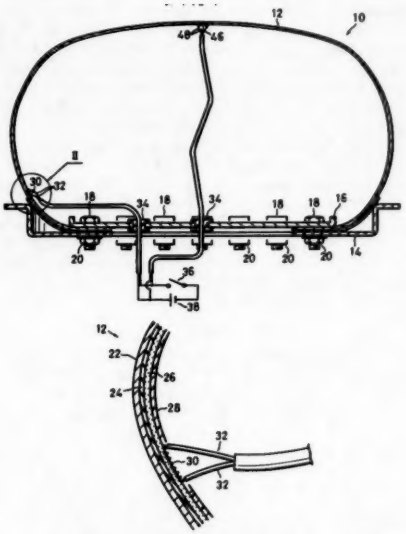
an inflatable bag to be inflated by the gas generated by said gas generating agent, said inflatable bag including a base cloth and a heat-resistive coating provided on an inner surface of said base cloth; and

a substantially imperforate protector cover provided inside of said inflatable bag;

said gas generating agent being provided in the form of a thin layer of a gelatinous material on an inner surface of said heat resistive coating;

said protector cover being disposed on an inner surface of said thin layer of said gas generating agent for isolating parts of said thin layer which face each other when said bag is folded up and for preventing said thin layer from coming off;

said igniter being provided in a part of said thin layer of said gas generating agent wherein said protective cover is



melted and/or torn down when gas is generated by said gas generating agent.

5,066,040

MOTOR VEHICLE ROLLOVER BAR DRIVING SYSTEM

Wolfgang Dangl, München; Gerald Schick, Unterschleissheim; Reinhard Nowack, and Gerhard Reuber, both of Drolshagen, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,601

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925513

Int. Cl.[5] B60R *21/13*

U.S. Cl. 280—756 **26 Claims**

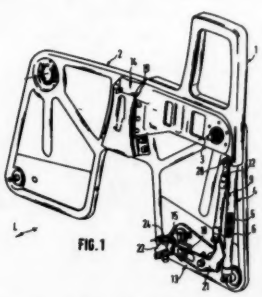


FIG.1

1. A driving system for each of at least one motor vehicle rollover bar, particularly for a convertible vehicle, which can be displaced from a lowered position to an upwardly directed supporting position and back to the lowered position, comprising a sensor-controlled first control device actuatable under the effect of a spring loading, a second control device which can be controlled in a moving direction, both control devices supporting against the vehicle body, a holding mechanism for the at least one rollover bar in the lowered position is provided at the vehicle body, and a locking device for the at least one rollover bar in the supporting position is also provided at the

vehicle body, wherein the at least one rollover bar is disposed on a base plate mounted transversely at the vehicle body.

5,066,041

CONTROL SYSTEM FOR STABILIZING THE ROLLING OF A VEHICLE

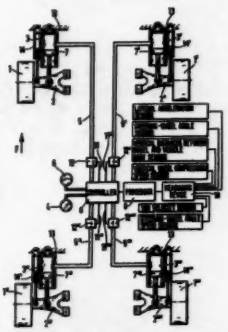
Siegfried Kindermann, Karlsfeld; Emil Györy, and Hans Heiland, both of München, all of Fed. Rep. of Germany, assignors to Baverische Motoren Werke AG, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 371,730, Jun. 27, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 642,553

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3821610

Int. Cl.[5] B60G *17/015*

U.S. Cl. 280—772 20 Claims



1. A control system for stabilizing the rolling of the vehicle body, comprising: control elements operatively arranged between the wheels and the vehicle body to generate forces approximately in a vertical direction with respect to the vehicle body to cause a rolling moment at the vehicle body which counteracts rolling motions acting on the vehicle body on response to driving conditions; and means for selectively actuating the control system only when threshold values of the vehicle lateral acceleration and of the vehicle steering-wheel turning angle are exceeded such that a magnitude of the rolling moment generated by the control elements, as a function of a first set of parameters comprising the approximately vertical wheel distances to the vehicle body, is at first substantially formed at the rear axle and, after actuation and during a transition period whose time length is determined as a function of a second set of parameters independently of the first set of parameters, the rolling moment distribution between the front-wheel and the rear-wheel axle is changed to a given fixed rolling moment distribution between the front-wheel axle and the rear-wheel axle at the end of the transition period.

5,066,042

BELT LOCK FOR A SAFETY BELT SYSTEM PROVIDED WITH A TIGHTENING MEANS

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Aug. 29, 1990, Ser. No. 574,749

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929114

Int. Cl.[5] B60R *22/46, 22/18, 22/16;* A44B *11/18*

U.S. Cl. 280—806 10 Claims

1. In a vehicle having a bodywork and seats, a safety belt system comprising:

a belt fitting having an insert tongue,

a belt lock,

an anchoring means for attachment to one of the vehicle bodywork and vehicle seat, and

a tightening means operative between the belt lock and the anchoring means,

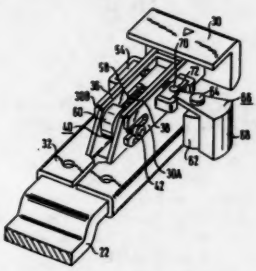
the belt lock comprising:

a housing provided with a guide path for the insert tongue,

a detent opening in the insert tongue,

a latch mounted in the housing and displaceably guided therein in a direction transverse to the guide path between a holding position in which the latch engages the detent opening of the insert tongue and a release position in which the latch is disengaged from said detent opening,

a blocking member mounted in the housing and displaceably guided in parallel to the guide path between a holding position in which the blocking member maintains said latch in its holding position and a release position in which the blocking member disengages said latch to allow the latter to move to its release position,



a manually operable release button mounted in the housing and likewise displaceably guided therein in parallel to the guide path, said release button being coupled to said blocking member to move the latter to its release position, whereby the latch is also moved to its release position out of engagement from the detent opening of the insert tongue,

a two-armed lever pivotally mounted on said housing about a pin perpendicular to said guide path, said lever having a first arm mounting a compensation mass and a second arm in force-transmitting engagement with one of the release button and the blocking member,

the improvement wherein the first arm of the two-armed lever has a bent portion formed by said compensation mass and extending perpendicularly to said guide path and laterally of said housing.

5,066,043

ADJUSTABLE SHOULDER ANCHORAGE

Osamu Tokugawa, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1990, Ser. No. 557,002

Claims priority, application Japan, Jul. 25, 1989, 1-87209[U]

Int. Cl.[5] B60R *22/20, 22/24*

U.S. Cl. 280—808 7 Claims

1. An adjustable shoulder anchorage comprising:

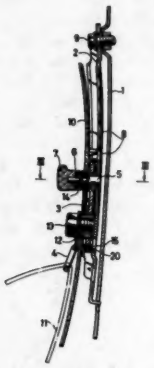
a base defining a plurality of engagement portions distributed at predetermined intervals along the length of said base;

a slide anchor provided movably under guidance along said base and carrying a joint on which a webbing is supported;

a lock member provided on said slide anchor, said lock member being selectively engageable with said engagement portions;

a stopper provided on a side of one end of said base so that movement of said slide anchor can be limited; and

impact absorber means interposed between said stopper and said slide anchor for reducing impact noise, wherein said



impact absorber means is flexed when said slide anchor is brought into abutment against said stopper.

5,066,044

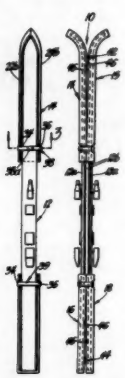
SKI GUARDS

Kenneth P. Adasek, 11367 Nancy Dr., Warren, Mich. 48093

Filed Mar. 21, 1990, Ser. No. 496,945

Int. Cl.[5] A63C *11/02*

U.S. Cl. 280—815 **12 Claims**



1. A ski edge guard assembly for use with skis of different lengths, the skis having tips, tails, sides, tops with top corners and bottoms with bottom edges comprising:

a pair of rigid tail guard members having a closed end and an open end for removably receiving the tips of the pair of skis and said tip guard members including a base portion juxtaposed against the bottom of each ski of the pair of skis and including oppositely facing outboard surfaces when installed on the pair of skis;

a pair of rigid tip guard members having a closed end and an open end for removably receiving the tis of the pair of skis and each of said tip guard members including a base portion juxtaposed against the tip of each ski of the pair of skis and said base portions of said tip guard members having oppositely facing outboard surfaces when installed on the pair of skis;

first fasteners means secured on said oppositely facing outboard surfaces of said tail members and said tip guard members for joining said tail guard members and said tip guard members at an intermediate point thereon for providing spaced connection points between the pair of skis between the opposite ends thereon; said tail guard members and said tip guard members having sidewalls of a height which covers the sides of the skis and said sidewalls and said base portions of said joined tail guard members and said tip guard members forming an H-shaped cross-section therethrough; and

second fastener means secured on said tail guard members for holding said tail guard members together and for holding the ski tails in said tail guard members when assembled thereon and third fastener means secured on said tip guard members for holding said tip guard members together and for holding said tips in said tip guard members;

said second and third fastener means including means on the open end of said tail guard members and on the open end of said tip guard members for defining a lock groove and retention means located in said lock groove for joining said tail guard members and said tip guard members at the open ends thereof.

5,066,045

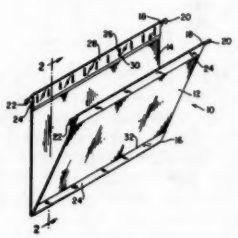
HANGING LAMINATED FOLDER

Robert E. Hawes, Jr., Huntington Bay; Cheryl Dellacroce, Baldwin; Eric Aaldenberg, Bayside, all of N.Y., and James J. Lynch, Berkley Heights, N.J., assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Feb. 21, 1990, Ser. No. 483,094

Int. Cl.[5] A47B *63/00*

U.S. Cl. 281—45 **10 Claims**



1. A hanging folder comprising:

a sheet of flexible material folded at a medial line to form a bottom edge with a lower surface, and front and rear portions joined at the bottom edge, the edges of the front and rear portions remote from the bottom edge being folded over to form top terminal folded portions;

rods complementary to a standard filing frame being disposed through said top terminal folded portions; and

first reinforcing means in the form of a strip of plastic material disposed along a major portion of, and covering, said top terminal folded portions; and

second reinforcing means in the form of a strip of plastic material disposed along a major portion of said bottom edge of the folder for increasing the wear resistance, strength and life of the lower surface of the bottom edge, said strip covering the medial line and lower areas of said front and rear portions.

5,066,046

METHOD AND APPARATUS FOR ALLOCATING AND RECORDING TIME BLOCKS ON VCR TAPES

Brett R. Hoopingarner, Tempe, Ariz., assignor to E. W. Hudson, III, Tempe, Ariz.

Filed Dec. 4, 1989, Ser. No. 445,417

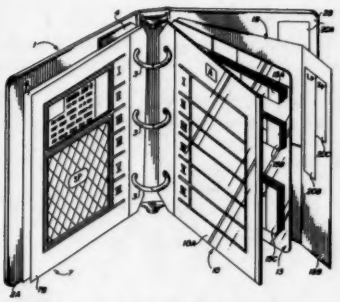
Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—70 **16 Claims**

11. A method for visual logging of programs recorded on videocassettes using a log sheet including a plurality of adja-

cent identical recording time areas, dimensions of which represent consecutive recording time intervals on a videocassette, and a plurality of different-sized markable program description labels each having an area corresponding to a preselected recording time interval, comprising the steps of:

(a) entering information about a recorded program on one of the labels corresponding in size to a duration of the recorded program;



(b) attaching the program description label on one of the recording time areas of the log sheet corresponding to a portion of a videocassette on which the program entered on the recording time area is recorded;

(c) repeating steps (a) and (b) for a different program and a different program description label,

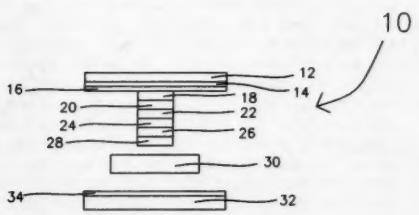
whereby the log sheet provides a visual representation of portions of the videocassette on which identified programs are pre-recorded and portions of the videocassette available for recording other programs.

5,066,047

PROCESS FOR INCORPORATING HOLOGRAM INTO LAMINAR STRUCTURE WITH PHOTOGRAPH

Dennis R. Mailloux, Westminster, Mass.; Harry A. Smith, Nashua, N.H., and Neal F. Kelly, Woburn, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 5, 1990, Ser. No. 577,778
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—86 **31 Claims**



1. A laminar structure comprising:

a first sheet at least a portion of which is substantially transparent;

a supported hologram comprising a hologram disposed on a support sheet with the support sheet disposed adjacent one surface of the first sheet;

a substantially moisture-impermeable barrier layer secured to the surface of the hologram remote from the support sheet;

a photograph;

an adhesive layer lying between and adhered to the photograph and the barrier layer, the adhesive layer comprising a material capable of adhering the barrier layer to the photograph while the photograph is still wet; and

a second sheet adhered to the first sheet such that the supported hologram, barrier layer, adhesive layer and photograph lie between the first and second sheets,

such that the hologram and the photograph can be viewed through the substantially transparent part of the first sheet, and the hologram is sufficiently adhered to the photograph that if an attempt is made to separate the hologram from the photograph, fracture will occur within the hologram or between the hologram and the support sheet, so that at least part of the hologram will remain attached to the photograph.

13. A process for incorporating a supported hologram into a laminar structure which also comprises first and second sheets and a wet photograph, at least a portion of the first sheet being substantially transparent, said supported hologram comprising a hologram disposed on a support sheet, which process comprises:

providing on the surface of the hologram remote from the support sheet a substantially moisture-impermeable barrier layer;

providing, on the opposed side of the barrier layer from the hologram, an adhesive layer capable of adhering the hologram and barrier layer to a wet photograph;

bringing together the first and second sheets, the wet photograph, the supported hologram and the barrier and adhesive layers with the photograph being disposed adjacent the second sheet, the adhesive layer being disposed adjacent the photograph and the supported hologram being disposed adjacent the first sheet; and

laminating the first and second sheets, the wet photograph, the supported hologram and the barrier and adhesive layers together, such that the first and second sheets are bonded together and the hologram and the photograph can be viewed through the substantially transparent part of the first sheet, and the hologram becomes sufficiently adhered to the photograph that if an attempt is made to separate the hologram from the photograph, fracture will occur within the hologram or between the hologram and the support sheet, so that at least part of the hologram will remain attached to the photograph.

5,066,048

WEIGHT SET CONNECTING MECHANISM FOR SUBSEA TUBULAR MEMBERS

Thomas J. Farrell, Houston, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 26, 1990, Ser. No. 498,825
Int. Cl.[5] F16L *55/07*
U.S. Cl. 285—18 **9 Claims**

1. A subsea well connecting mechanism for connecting an inner member within an outer member comprising

an outer member having an upwardly facing member within an outer member comprising

an outer member having an upwardly facing internal landing seat and a downwardly facing internal shoulder above the landing seat,

an inner member having an outer, upwardly facing shoulder and means for engaging said outer member landing seat when said inner member is landed on said outer member to support said inner member therein,

latching and loading means supported on the outer shoulder of said inner member and when said inner member is landed within said outer member in a position with the outer member supporting said inner member said latching and loading means engage said downwardly facing internal shoulder of said outer member with sufficient upward force to provide a preselected preload tension in said outer member, and said means for engaging said outer member landing seat comprising

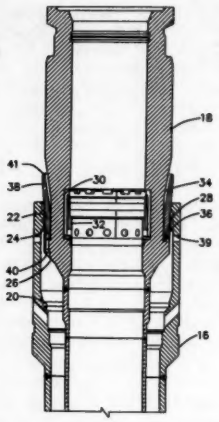
a landing shoulder on said inner member,

said latching and loading means includes a plurality of fingers supported from said upwardly facing shoulder of said inner member,

each of said fingers when seated on said inner member ex-

tending upwardly and outwardly and being of sufficient length to engage said downwardly facing inner shoulder on said outer member,

said fingers have sufficient resilience to pass through the upper interior of said outer member above said downwardly facing inner shoulder and to spring back member upwardly and said outer, upwardly facing shoulder on said inner member downwardly to provide said tension preload in said outer member.

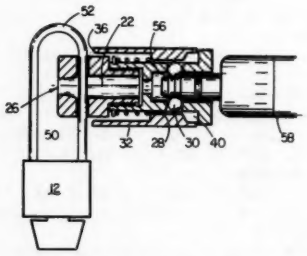


5,066,049

LOCKOUT DEVICE FOR HOSE FITTING

Peter J. Staples, Newark, N.Y., assignor to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 13, 1990, Ser. No. 612,765
Int. Cl.[5] F16L *55/10*
U.S. Cl. 285—80 **9 Claims**



1. A lockout apparatus to prevent delivery of fluid through a male hose fitting, said male hose fitting normally connectable to a mating female hose fitting to enable delivery of fluid therethrough, comprising:

a generally cylindrical body, said body including a bore having a first opening for accepting said male hose fitting, said body further including a tail portion, said body adapted to prevent said body from being placed in mating fluid connection with said holding means in said bore for selectively holding said male fitting in said bore;

a generally cylindrical moveable member overlying said body and mounted for movement longitudinally thereon, said moveable member in operative connection with said holding means, in a first position of said member said holding means holding said fitting in said bore and in a second position said fitting enabled to be removed from said bore, said tail portion of said body extending beyond said moveable member when said member is in the first position;

a lock member;

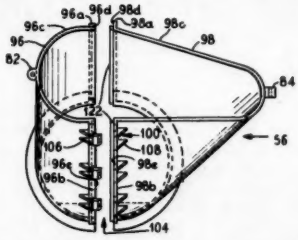
lock member accepting aperture means in said tail portion of said body for accepting said lock member, said lock member preventing movement of said moveable member from said first position when said lock member is accepted in said lock member accepting aperture means.

5,066,050

DRYER TRANSITION DUCT

Gerald L. Kretchman, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 354,748, May 22, 1989, Pat. No. 4,989,347.
This application Oct. 18, 1990, Ser. No. 599,518
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—319 **13 Claims**



1. A duct for use in an air handling system comprising:

a pair of U-channel shaped members, each member having a pair of leg portions connected by an arcuate bight portion, each of said leg portions opposed to a respective corresponding leg portion on the respective opposite member, said pair of leg portions extending perpendicularly from said arcuate bight portion;

a free edge of each leg portion of one of said U-channel shaped members being configured so as to mate with an opposing free edge of a leg member of the other of said U-channel shaped members such that the two U-channel shaped members can be united as a unit forming a central passage enclosed by a circumferential wall;

self-locking engagement means integrally formed on one U-channel shaped member, adjacent said free edges thereof, arranged to engage with opposing compatible self-locking engagement means on a respective other of said U-channel shaped members, for locking said U-channel shaped members together, when pressed together with said free edges in mating engagement wherein said free edges on one of said U-channel shaped members have a projecting tongue portion and said free edges on the other of said U-channel shaped members have a mating groove portion, said projecting tongue portion and said mating groove portion oriented to be interengaged when said U-shaped members are pressed together.

5,066,051

ANTI-TWIST COUPLING ASSEMBLY WITH BIASING MEANS

Jeffrey L. Weigl, Northfield Center, and Gerald A. Babuder, Mentor, both of Ohio, assignors to Cajon Company, Macedonia, Ohio

Filed Jan. 23, 1990, Ser. No. 468,691
Int. Cl.[5] F16L *15/00*
U.S. Cl. 285—328 **20 Claims**

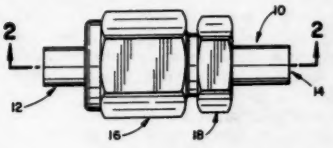
1. A tube coupling comprising:

first and second coupling components each having flow passages terminating in openings formed in transversely extending end faces carrying sealing surfaces;

said first and second coupling components being positioned with said end faces in aligned face-to-face relationship;

first and second nut members associated respectively with said first and second coupling components and cooperating to define a chamber about the end faces of said first and second coupling components, said first and second nut members being joined by threaded portions arranged such that rotation of said first nut member in a first direction relative to said second nut member produces movement of said first nut member axially toward said second nut member;

radially extending flange portions on said first and second coupling components engaged respectively by said first and second nut members such that movement of said first



nut member toward said second nut member causes said sealing faces on said coupling components to move toward one another; and,

an anti-twist means located between said first nut member and said first coupling component for conducting axial forces from said first nut member to said first coupling component, said anti-twist means comprising an anti-twist member separate from said first nut member and cooperating with said second nut member through axially engaged protrusions for preventing relative rotation therebetween during rotation of said first nut member in said first direction, said anti-twist member further including biasing means for maintaining said anti-twist member continuously biased toward said second nut member.

5,066,052

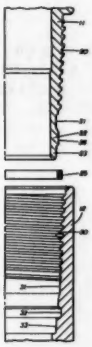
THREADED PIPE JOINT HAVING IMPROVED SEAL RING ENTRAPMENT

Shannon R. Read, Houston, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Continuation of Ser. No. 320,476, Mar. 8, 1989, Pat. No. 4,944,538. This application Jan. 25, 1990, Ser. No. 470,116

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—334 **2 Claims**



1. A pin member for use with a box member to form a threaded, sealed joint, said box member having an inwardly tapered threaded section and a sealing groove below a lower end of its threaded section and a deformable seal ring in said seal ring groove, said pin member comprising;

a tool joint member having an inwardly tapered threaded section on its outer periphery, an extrusion hump having a given diameter below the end of said threaded section for entrapping said seal ring to form a seal, said pin member having an area between the lower end of said threaded section and the extrusion hump of a diameter less than the said given diameter of said extrusion hump and a first smooth, inwardly tapered surface on said outer periphery below and immediately adjacent to said extrusion hump having its greatest diameter less than the said given diameter of said extrusion hump.

5,066,053

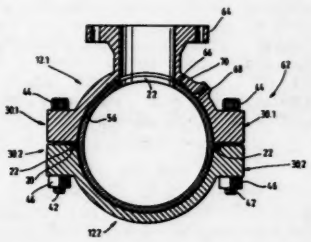
CLAMP WITH PIPE BRANCH

Jack E. Miller, Houston, Tex., assignor to International Clamp Company, Houston, Tex.

Division of Ser. No. 364,628, Jun. 8, 1989, Pat. No. 5,004,275, which is a division of Ser. No. 237,308, Aug. 26, 1988, Pat. No. 4,895,397, which is a continuation of Ser. No. 840,329, Mar. 14, 1986, Pat. No. 4,790,058. This application Sep. 19, 1990, Ser. No. 585,299

Int. Cl.[5] F16L *21/06*

U.S. Cl. 285—373 **29 Claims**



19. A clamp for pipeline repair, the clamp comprising a plurality of clamp members to be clamped to each other about a pipeline to be repaired to complete the clamp, each clamp member having a sealing zone for receiving seal means and each clamp member having a radially extending heat protection groove that is separate from the sealing zone and spaced between the sealing zone and a peripheral zone of the clamp member to interrupt heat flow from the peripheral zone to the sealing zone during welding of the peripheral zone and thereby provide protection for seal means when positioned in the sealing zone, wherein at least one clamp member has a pipe branch extending therefrom.

5,066,054

MOTOR-VEHICLE DOOR LATCH WITH ANTITHEFT FEATURE

Jürgen Ingenhoven, Velbert, Fed. Rep. of Germany, assignor to Kiekert GmbH & Kommanditgesellschaft, Heiligenhaus, Fed. Rep. of Germany

Filed Nov. 23, 1990, Ser. No. 617,026

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1989, 3938680

Int. Cl.[5] E05C *3/26*

U.S. Cl. 292—201 **8 Claims**

1. A motor-vehicle door latch for use on a vehicle door having a handle and an inside locking element, the latch including:

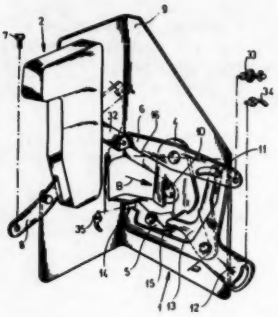
a housing;

a latch fork pivotal on the housing and engageable in a locking position with a door bolt to retain same and lock the door;

an actuating lever pivoted on the housing and connected to the handle;

a release pawl operatively engageable with the fork to release same from the locking position;

a link displaceable between a position coupling the actuating lever to the release pawl for displacement of the fork out of the locking position by actuation of the actuating lever and a position decoupling the actuating lever from the release pawl, whereby in the decoupling position actuation of the actuating lever will not unlock the door; and



central actuating means including

an actuator in the latch displaceable into an antitheft position, and

a coupling having one side connected to the inside locking element and an opposite side connected to the link for coupling the link to the inside locking element for movement thereby between its positions except when the actuator is in the antitheft position of the actuator.

5,066,055

LOCKING DEVICE FOR HOOD

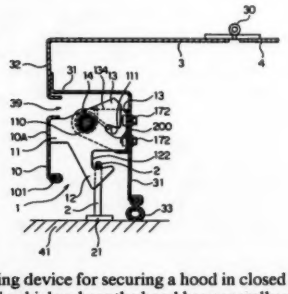
Takeshi Saitoh, and Nozomu Kohno, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 5, 1990, Ser. No. 609,424

Claims priority, application Japan, Nov. 13, 1989, 1-294463

Int. Cl.[5] E05C *3/04*

U.S. Cl. 292—228 **4 Claims**



1. A locking device for securing a hood in closed position on an industrial vehicle where the hood has generally vertical side walls with bottom edges that engage substantially horizontal surfaces on the body of the vehicle when the hood is in closed position, said hood being joined to the body of said vehicle for pivoting movement about an axis adjacent a first side of said hood such that said edges separate from said horizontal surfaces upon opening of said hood, one of said vertical side walls on a side of said hood other than said first side having a recess within which is disposed a latching mechanism, a keeper secured to said surface of said vehicle body below said recess, said latching mechanism cooperating with said keeper and comprising a bearing plate having arms generally parallel and extending perpendicularly from said one side wall of the hood and a bight portion between said arms and secured to said one side wall within said recess, a latch plate which is generally sector-shape with a narrow side connected by diverging lateral sides to a broad side, and having a pair of notches formed in said broad side such as to provide in succession a hook portion adjacent a lateral side of the sector-shape plate, a first notch for receiving a portion of said keeper, a first stop finger, a notch for receiving one end of a biasing spring, and a second stop finger adjacent an opposite lateral side of the sector-shape plate, a heel portion on said latch plate on the narrow side, means pivotally mounting said latch plate between said arms of said bearing plate for rotation about an axis normal to said latch plate and passing through said latch plate between said heel portion and said broad side, a spring coupled between said bearing plate and said second notch in said latch plate for biasing said latch plate into latching engagement with said keeper when said hood is in closed position, an operating lever joined to said heel portion of said latch plate normal thereto and positioned, when said latch plate is in latch closed condition, substantially coplanar with the adjacent vertical side wall of said hood and dimensioned to fit within the entrance to said recess with a bottom edge substantially parallel to and spaced from the underlying surface of said vehicle body sufficient to permit convenient insertion of the fingers of a hand therebetween, said hook portion of said latch plate having an inclined outer edge which upon closing of an opened hood engages said keeper and acts through camming action to rotate said latch plate against the urging of said biasing spring until said hook portion snaps over and under said keeper into latching position.

5,066,056

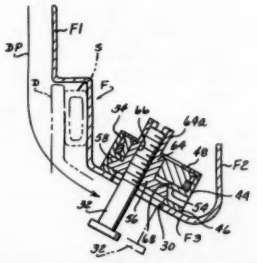
POWER STRIKER FOR AUTOMOTIVE DOOR LATCH

William W. Schap, Muskegon, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Sep. 24, 1990, Ser. No. 587,294

Int. Cl.[5] E05B *15/02*

U.S. Cl. 292—341.16 **18 Claims**



1. A power striker assembly for driving a striker pin of a door latch in horizontal movement between a ready latch receiving position and an actuated latch holding position, said striker assembly comprising a stationary base plate lying in a first vertical general plane, an elongate striker pin projecting freely through an opening through said base plate with the longitudinal axis of said pin perpendicular to said first general plane, first means mounting said pin upon said base plate for movement relative to said base plate along a fixed horizontal path between said ready position and said actuated position, a drive member lying in a second general plane parallel to said first general plane and having a central axis of rotation perpendicular to said first general plane, said drive member having an eccentrically located bore therein rotatively receiving said striker pin, second means mounting said drive member upon said base plate for rotation relative to said base plate about said central axis between a first and a second rotative position and for movement relative to said base plate along a fixed vertical path, rotation of said drive member between said first and

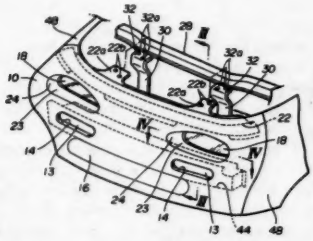
second positions being operable to shift said pin between said ready and said actuated positions, and drive means coupled to said drive member for driving said drive member in rotation between said first and second rotative positions.

5,066,057

BUMPER STRUCTURE

Katsumi Furuta, Isehara, and Takashi Yamaguchi, Ebina, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 16, 1990, Ser. No. 596,939
Claims priority, application Japan, Oct. 20, 1989, 1-273088
Int. Cl.[5] B60R *19/03*
U.S. Cl. 293—121 **9 Claims**



1. A bumper structure for a vehicle having headlamps, said bumper structure comprising:

an armature secured to a body of said vehicle;

a bumper fascia having openings for receiving therein said headlamps, said bumper fascia extending along and covering said armature;

a plurality of first brackets secured to the vehicle body;

a plurality of second brackets secured to an upper portion of said bumper fascia;

a plurality of third brackets secured to said armature, each of said third brackets having a groove which faces toward said bumper fascia;

hem portions defined by said bumper fascia which surround said openings, each of said hem portions having a leading end which is thrust into one of said grooves of said third brackets; and

means for connecting said first brackets to said second brackets, respectively.

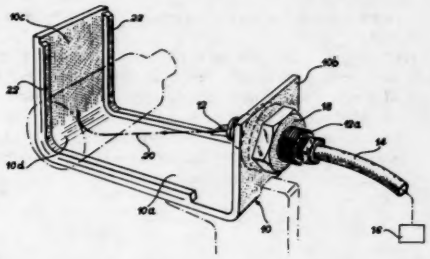
5,066,058

PNEUMATIC GRIPPER

Alain Guyard, Saint Paul-Trois Châteaux, France, assignor to Cogema Compagnie Generale des Matieres Nucleaires, Cedex, France

PCT No. PCT/FR89/00508, § 371 Date May 29, 1990, § 102(e) Date May 29, 1990, PCT Pub. No. WO90/03871, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 2, 1989, Ser. No. 460,140
Claims priority, application France, Oct. 3, 1988, 88 12896
Int. Cl.[5] B66C *1/02*
U.S. Cl. 294—1.1 **3 Claims**

1. A pneumatic gripper, comprising a substantially U-shaped support including a plate having an intermediate branch and two end branches, an ejection nozzle carried by a first of said end branches and connected to a compressed air source, said ejection nozzle supplying a compressed air jet which strikes the intermediate branch in the vicinity of a bend formed in said plate, at the intersection of the intermediate branch with a second of said end branches, jet guide means being provided on said plate to channel the compressed air jet from said intermediate branch to an end of said second end branch opposite to said bend.

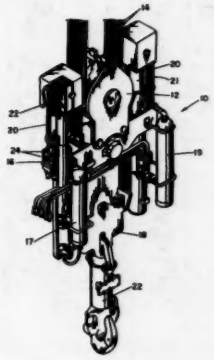


5,066,059

DRILL STRING COMPENSATOR WITH IMPROVED TRANSLOADERS

Gary L. Egbert, and Philip L. Ziegler III, both of Houston, Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Filed Apr. 3, 1990, Ser. No. 504,113
Int. Cl.[5] B66C *1/34, 13/04*
U.S. Cl. 294—82.16 **32 Claims**



1. A drill string compensator for supporting a tubular string having an axis and passing through a marine vessel subject to wave action, the drill string compensator comprising:

a first frame supported above the marine vessel and controllably moveable along the axis of the tubular string;

a second frame supported by the first frame and movable with respect to the first frame along the axis of the drill string;

one of the first and second frames having a plurality of bores therethrough;

a plurality of flexible force transmitting members for interconnecting the first and second frames;

a plurality of threaded rods each connected to an end of a respective one of the plurality of flexible force transmitting members and passing through a respective one of the plurality of bores:

a plurality of nuts each associated with a respective one of the threaded rods: and

a plurality of ring-shaped transloader assemblies for uniform tensioning of the flexible force transmitting members, each of the transloader assemblies being positioned about and axially movable with respect to its respective threaded rod, each transloader assembly including:

(a) a sleeve positioned between a respective nut and the

frame having the plurality of bores for transmitting load forces from the respective nut to the frame having the plurality of bores,

(b) a biasing device for exerting a biasing force on the respective nut and the corresponding force transmitting member, and

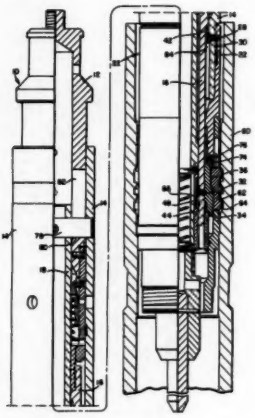
(c) a follower movable with respect to the sleeve for compressing the biasing device in response to rotation of the respective nut with respect to the respective threaded rod, such that the selective positioning of each of the nuts along its respective threaded rod ensures an equal working length for each of the respective flexible force transmitting members.

5,066,060

RUNNING TOOL

Andrew G. Cooksey, Coppell, and David L. Reesing, Irving, both of Tex., assignors to Otis Engineering Corp., Dallas, Tex.

Filed Apr. 11, 1990, Ser. No. 508,250
Int. Cl.[5] E21B *23/02*
U.S. Cl. 294—86.18 **15 Claims**



1. A running tool for use with subsurface wireline equipment, the running tool comprising:

means for releasably coupling the running tool to a lock mandrel to permit the lock mandrel to be lowered into engagement with a landing nipple in a well bore;

means for locking the lock mandrel in the landing nipple;

means for retrieving the lock mandrel while still coupled to the running tool in case of a misrun; and

means for releasing the running tool from the lock mandrel after the lock mandrel is locked in the landing nipple;

the running tool comprising first and second concentrically disposed, longitudinally slidable sleeve members;

the means for releasably coupling the running tool to the lock mandrel comprising at least one radially slidable lug member adapted to engage a recess in the lock mandrel when the first sleeve member is moved in a downward direction radially inward from the second sleeve member, the lug member being adapted to withdraw from the recess in the lock mandrel whenever the first sleeve member is moved in an upward direction radially inward from the second sleeve member; and

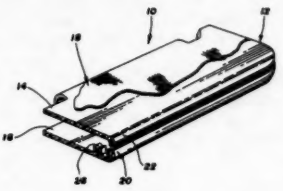
the first sleeve member being adapted to move in the upward direction radially inward of the second sleeve member whenever the running tool is jarred upwardly.

5,066,061

SUNVISOR INCLUDING A METHOD AND ATTACHMENT MECHANISM FOR SECURING A COVERING TO THE SUNVISOR

Douglas C. Miller, Hersey, Mich., assignor to Plasta Fiber Industries, Inc., Marlette, Mich.

Filed Nov. 2, 1990, Ser. No. 609,159
Int. Cl.[5] B60J *3/00*
U.S. Cl. 296—97.1 **8 Claims**



1. An attachment mechanism for use with a sunvisor including a plastic shell having upper and lower halves and an outer covering having free edge portions, for securing the covering on the shell so that the covering is prevented from working loose during assembly, comprising:

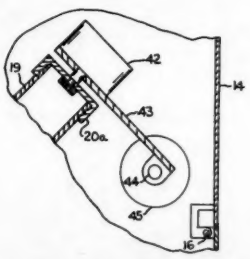
a trap means or plurality of trap means, attached to or integral with an inner surface of a shell half, having one or more members which flex to allow the covering to enter, but which grabs and maintains tension on the covering prior to and upon closing of the upper and lower shell halves.

5,066,062

FUEL TANK LOCK

Bill G. Sekulovski, 1363 Harvest Bend, Windsor, Ontario, Canada N9H 2B5

Filed Sep. 13, 1990, Ser. No. 581,895
Int. Cl.[5] B62D *39/00*
U.S. Cl. 296—97.22 **7 Claims**



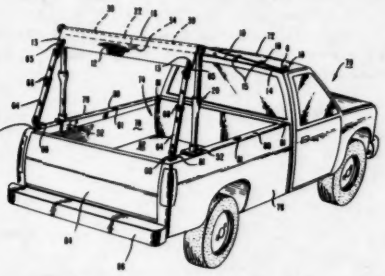
1. In an automotive vehicle having an exterior wall, an opening in said wall, a lid movably mounted on the vehicle to close said opening, a fuel tank filler tube having an open end registering with said wall opening whereby fuel may be pumped into said filler tube when the lid is moved to an open condition, and a cap having a screw thread connection with the filler tube for normally closing its open end, the improvement comprising: a rotary reversible electrical motor having a drive connection with said cap for normally holding the cap in a closed position on the filler tube; means for supplying electrical power to said motor; and a switch means located in the driver compartment of the vehicle for controlling the delivery of electrical power to said motor; said drive connection being effective so that rotation of the motor in one direction screws the cap onto the filler tube, and rotation of the motor in the other direction unscrews the cap from the filler tube.

5,066,063

REMOVABLE COVER FOR A TRUCK CARGO BOX

Regis K. Mullally, 4973 SE. Grouper Ave., Stuart, Fla. 34997

Filed Sep. 17, 1990, Ser. No. 583,591
Int. Cl.[5] B60P 7/04
U.S. Cl. 296—100 13 Claims



1. A removable cover assembly for a cargo box of a truck comprising:

flexible cover means;

a cover support for elevating a portion of the cover means above the cargo box, said cover support including at least one collapsible frame for removably engaging the cargo box, said frame including top support members pivotally connected to one another at inner end thereof, and having outer ends, and a pair of vertical support members pivotally connected to said outer ends, whereby each of said top support members and vertical support members can be pivoted to positions of substantially parallel and adjacent alignment relative to each other to collapse said cover support to a size convenient for transport and storage;

front fastening means for attaching a front portion of the cover means to a front portion of the truck; and

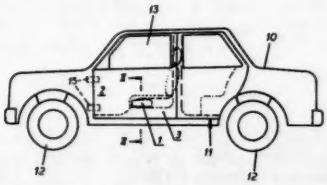
rear fastening means for connecting a rear portion of the cover means to a rear portion of the truck.

5,066,064

DOOR ASSEMBLY FOR A PASSENGER VEHICLE

Peter Garnweidner, Lamprechtshausen, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau am Inn, Austria

Filed Oct. 31, 1990, Ser. No. 607,166
Claims priority, application Austria, Nov. 2, 1989, 2527/89
Int. Cl.[5] B60J 5/04
U.S. Cl. 296—146 11 Claims



1. A door assembly for an automotive vehicle, comprising:

a vehicle body formed with a door opening and a threshold member extending horizontally along a bottom portion of said door opening;

a vehicle door lying in a door plane, swingably mounted on said vehicle body and having a door frame laterally juxtaposed with said threshold member at a lower portion thereof above a bottom edge of said door, and an outer door skin spanning said door frame; and

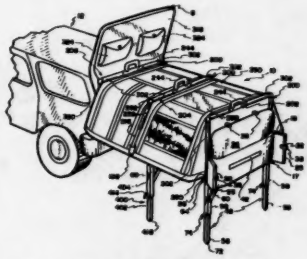
a horizontal strut positioned at a location substantially midway along a length of said door and disposed between said door frame and said skin in said door at a level with said threshold member, said strut extending normal to said plane of the door and being formed at opposite ends with abutment plates respectively juxtaposed with said frame and said skin, means being provided for securing the abutment plate juxtaposed with said frame to said frame, the abutment plate juxtaposed with said skin being spaced therefrom.

5,066,065

CONTAINERIZED RETRACTABLE/EXPANDABLE SLEEPING COMPARTMENT FOR VEHICLES

Milo Baughman, 560 E. South Temple, Salt Lake City, Utah 84102

Continuation-in-part of Ser. No. 366,553, Jun. 15, 1989, Pat. No. 5,011,216. This application Oct. 11, 1990, Ser. No. 596,891
Int. Cl.[5] B60P 3/345
U.S. Cl. 296—165 44 Claims



1. A manually portable temporary shelter comprising expandable/collapsible sleeping compartment structure comprising a collapsible/extendable canopy covering having weight and by which an interior sleeping space is defined by top and side wall means of the canopy covering and collapsible/extendable support structure comprising means connected to the canopy covering so that the support structure and the canopy covering extend and collapse together in a rectilinear fashion, the support structure comprising means by which the weight of the canopy covering and any person occuyping the sleeping space is transferred with no more than inconsequential deflection to the extended support structure;

the temporary shelter further comprising a hand-held openable container comprising an interior and means associating the sleeping compartment structure with the interior of the container whereby the canopy covering and the support structure are unitarily extended entirely from within and collapsed entirely into the container and the container with the unitarily collapsed canopy covering and the support structure toted manually from place to place including independently manually into and from a vehicle.

5,066,066

PLATE TRAILER JOINTS

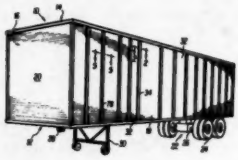
Howard J. Yurgevich, Monticello, and Stanley J. Navoczynski, Lafayette, both of Ind., assignors to Rosby Corporation, Monon, Ind.

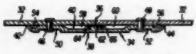
Filed Mar. 5, 1991, Ser. No. 664,668
Int. Cl.[5] B62D 33/04
U.S. Cl. 296—181 11 Claims

1. A joining member for joining an adjacent pair of plates on a side of a cargo carrier, the joining member comprising:

a rectilinear strip having an outer surface, an inner surface, parallel edges joining the outer and inner surfaces, and two rows of aperatures extending between the outer and inner surfaces, one row adjacent each of the edges for receiving means for fastening the strip to said plates, the inner surface of the strip including a pair of flanges posi-

tioned between the two rows of aperatures, and a channel of uniform depth situated between the pair of flanges, and





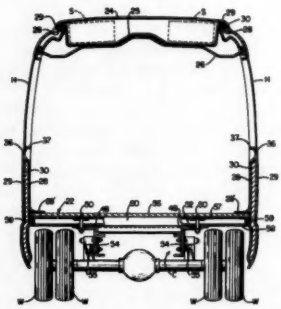
a sealing strip fixed in said channel having a width about equal to the distance between said pair of flanges, a length equal to the rectilinear strip length, and a thickness greater than the channel depth.

5,066,067

PREFABRICATED BUS HOUSING

Houshang Ferdows, Boulder, Colo., assignor to Relco, Inc., Lamar, Colo.

Filed Sep. 18, 1989, Ser. No. 408,724
Int. Cl.[5] B62D *25/00*
U.S. Cl. 296—197 **11 Claims**



1. In a prefabricated vehicle provided with a chassis and ground-engaging wheels mounted on said chassis, the improvement comprising:

an elongated housing including modular front and rear sections, a modular roof section, and modular side sections on opposite sides of said housing, each said section having inner and outer substantially rigid plastic skin members in closely spaced parallel relation to one another and a lightweight filler material between said skin members, beam members projecting inwardly at spaced intervals to one another along said side sections, said side sections having peripheral edges in adjoining relation to one another, flanges being disposed along said adjoining peripheral edges of said sections, and means interconnecting said flanges together, said beam members being of generally channel-shaped configuration with an open end of each said beam member in abutting relation to an inner surface of said outer skin member, and securing means for securing each said beam member to an inner surface of said outer skin member; and

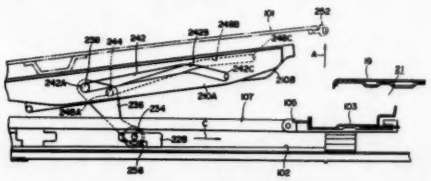
a floor section rigidly mounted on said chassis, and attaching means for rigidly attaching said front and rear sections as well as said side sections to outer peripheral edges of said floor section.

5,066,068

PANEL MOVING MECHANISM FOR SUNSHINE ROOF

Katsuhiro Suzuki; Akira Nishimura, both of Toyota; Takatsugu Yamauchi, Shinjuku; Kazuhisa Nagata, Okazaki, and Hironori Ochiai, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 333,573, Apr. 5, 1989, abandoned. This application Sep. 7, 1990, Ser. No. 579,350
Claims priority, application Japan, Apr. 5, 1988, 63-46108[U]; May 9, 1988, 63-60990[U]; May 11, 1988, 63-61839[U]; May 11, 1988, 63-61840[U]
Int. Cl.[5] B60J *7/05*
U.S. Cl. 296—221 **20 Claims**



1. A panel moving mechanism for a sunshine roof of the type in which a rear end of a panel for closing an opening provided in the roof of a vehicle can be raised to a tilt-up position and lowered to a tilt-down position, the mechanism comprising:

(a) means for rotatably supporting a front end section of said panel;

(b) a guide rail mounted in the vehicle adjacent to the opening in the roof and extending in the longitudinal direction of the vehicle;

(c) a shoe mounted for movement along the guide rail;

(d) means for selectively moving the shoe along the guide rail;

(e) an arm;

(f) means for pivotally mounting said arm on said shoe; and

(g) a guide means fixed in relation to said panel, said guide means including means provided with first and second elongated guide grooves, each guide groove having a longitudinal axis and a front end and a rear end, and first and second pins mounted on said arm, each pin being inserted into a respective one of said guide grooves so as to be guided for movement between the front and rear ends of the respective groove, said first and second guide grooves being arranged in such a manner that relative movement of said shoe toward one of the front and rear ends of said guide grooves causes said arm to be gradually brought to a raised position to raise the panel, and relative movement of said shoe toward the other of the front and rear ends of said guide grooves causes said arm to be gradually brought to a horizontal position to lower the panel.

5,066,069

CHAIR BACK AND SEAT ADJUSTMENT MECHANISM

Jacob DeGelder, San Pedro, Calif., assignor to Systems Furniture Company, Torrance, Calif.

Filed May 3, 1990, Ser. No. 518,378
Int. Cl.[5] A47C *1/024*
U.S. Cl. 297—374 **4 Claims**

1. A chair adjustment mechanism for use with a chair having a seat, a back and a pedestal comprising

a) an elongated frame mounted on the pedestal in a manner to hold such frame in a substantially horizontal plane;

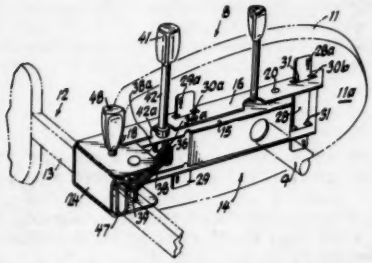
b) a seat support piece pivotally mounted about a first horizontal pivot pin on the frame;

c) a back bracket mounted about a second horizontal pivot pin on the seat support piece;

d) a first set of friction plates having elongated slots therein mounted to the second pivot;

e) a second set of friction plates having elongated slots therein mounted to a third horizontal pivot pin on the back bracket; and

f) a horizontal adjustment handle mounted through the frame and the slots of such sets of plates which first friction plate slots are aligned with one another and said



second friction plate slots are aligned with one another while each such slot set is at an angle to the other slot set and such adjustment handle is rotatable to compress the plates together in lock position

whereby the seat and back are adjustable about spaced apart pivot pins and each is capable of being held in selected independent orientations with the horizontal frame.

5,066,070

APPARATUS FOR REFLEX-PERCUSSIVE CUTTING OF CONCRETE ETC.

Ronald A. W. Clarke, 501 Wilkins St, Apt 717, London, Ontario, N6C 5G2, Canada

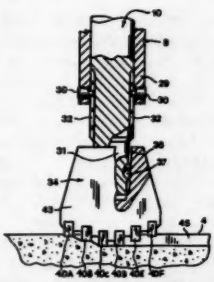
PCT No. PCT/GB89/00117, § 371 Date Aug. 3, 1990, § 102(e) Date Aug. 3, 1990, PCT Pub. No. WO89/07690, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 8, 1989, Ser. No. 543,732

Claims priority, application United Kingdom, Feb. 10, 1988, 8803087

Int. Cl.[5] E01C *23/09*

U.S. Cl. 299—37 **11 Claims**



1. Apparatus for cutting a groove in the surface of a hard material by reflex percussion, characterised in that the apparatus includes:

a pneumatically operated piston;

a cutting bar, which is arranged for direct cutting contact with the surface to be cut;

a frame, which includes a cylinder in which the piston is mounted for reciprocating movement along an axis of reciprocation;

a means for fixing the cutting bar to the piston to form a hammer assembly, the said means being such that the piston and cutting bar are, at all times during operation, constrained against all movements relative to each other in the direction of reciprocation;

a double acting pneumatic circuit, which is effective to force the hammer assembly under pressure hard onto the surface to be cut, and is effective then to drive the assembly, under pressure, away from the surface, before the hammer assembly naturally bounces clear of the surface;

a drive means for moving the cutting bar over the surface, and along the line of the groove to be cut;

and an anti-rotation means, which is effective to constrain the cutting bar against rotation relative to the frame, about the axis of reciprocation.

5,066,071

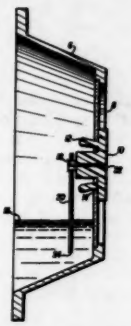
DEVICE FOR DETECTING METALLIC PARTICLES IN LUBRICANT

Robert W. Kinser, 1069 W. 27th St., Ogden, Utah 84401

Filed Aug. 24, 1990, Ser. No. 572,234

Int. Cl.[5] B60B *7/00*

U.S. Cl. 301—108 TW **12 Claims**



1. A device for visually detecting the presence of magnetic particles in the lubricating fluid of a vehicle hub, said hub having a transparent portion at the axial end thereof for viewing the lubricating fluid from outside the hub, said hub having an access opening in the axial end thereof, said device comprising

a plug body means of elastic deformable plastics material sealably fitable into said access opening;

an elongated member of magnetic material within said vehicle hub positioned to be exposed to said lubricating fluid and pivot means on the axially inner portion of said plug body means for pivotally mounting said elongated magnetic member so that as the hub rotates the elongated magnetic member is free to remain stationary in relation to the rotation of the hub and positioned so as to be viewable through said transparent portion, said magnetic member comprising a strip of plastics material having magnetizable particles therein and having an aperture near one end, said pivot means extending through said aperture for pivotally mounting said elongated magnetic member.

5,066,072

HYDRAULIC BRAKE PRESSURE CONTROL VALVE

Kunio Yanagi; Mutsuro Yamakoshi, and Akihiro Kamiyoshihara, all of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1990, Ser. No. 563,245

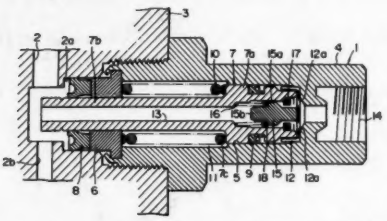
Claims priority, application Japan, Aug. 23, 1989, 1-98219[U]; Aug. 23, 1989, 1-98220[U]

Int. Cl.[5] B60T *8/26*

U.S. Cl. 303—9.75 **2 Claims**

1. A hydraulic brake pressure control valve of the type including a valve casing mounted upon a master cylinder of a hydraulic brake system and a valve piston of stepped configuration with an enlarged diameter portion and a reduced diameter portion mounted slidably and longitudinally along the

longitudinal bore of said valve casing, said stepped valve piston being urged normally toward a non-operating position thereof, and adapted to be shifted longitudinally in the opposite direction from said non-operating position, under the effect of a difference in the cross-section areas of said enlarged and reduced diameter portions thereof upon which the hydraulic brake fluid pressure works, and said stepped valve piston being defined with a brake fluid passage means extending longitudinally therein and providing communication between brake fluid passages adjacent said reduced diameter portion and said enlarged diameter portion of said stepped valve piston, and a



fluid valve member disposed in said fluid passage means and adapted to hold said fluid passage means in an open position when said stepped valve piston is in the non-operating position thereof, and to cause said fluid valve member to be opened and closed when said stepped valve piston operates in valving function, which further comprises cap-shaped retainer means mounted for shifting radially of a stem of said fluid valve member, disposed in an opposed relation to a valve seat of said stepped valve piston, when said fluid valve is brought to either of the open and closed positions thereof, one outer wall surface of said retainer abutting an inner wall surface of said stepped valve piston.

5,066,073

BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

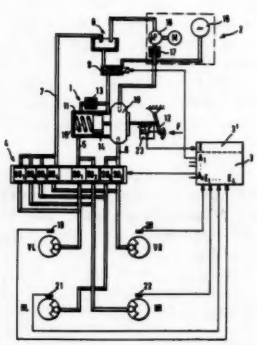
Heinz Frigger, Langen-Oberlinden, and Klaus-Dieter Blum, Kelkheim, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 733,706, May 13, 1985, abandoned. This application Jan. 14, 1986, Ser. No. 3,139

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3418044

Int. Cl.[5] B60T *17/22, 8/02*

U.S. Cl. 303—92 **3 Claims**



1. A brake system for automotive vehicles, said system comprising a brake pressure transmitter linked to wheel brakes through pressure medium lines, sensor means for detecting the braking effect at wheels to which the brakes are respectively attached, separating valve means for shutting off the flow of pressure medium in one switching position and located in at least one of the pressure medium paths leading to the wheel brakes, monitoring means responsive to the sensor signals for detecting failure of one wheel brake upon operation of the brakes, said monitoring means automatically switching over the separating valve means in the path leading to the failed wheel brake into a closed valve position, shutting off its flow of pressure medium, said sensor means being configured in the shape of electrical or electro-magnetic measured value pick-up units positioned at the individual wheels and generating an electric signal corresponding to the rotational behavior of the relevant wheel for input to an electronic linkage switching circuit.

5,066,074

PROCESS AND CIRCUIT ARRANGEMENT FOR CONTROLLING THE SLIP WHEN BRAKING A ROAD VEHICLE

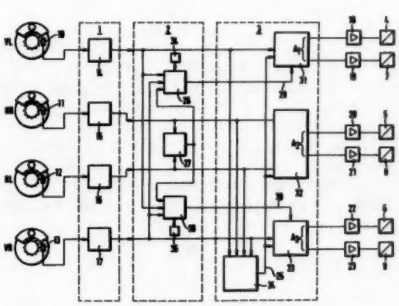
Hans Wupper, Friedrichsdorf, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 781,334, Sep. 30, 1985, abandoned. This application Dec. 4, 1986, Ser. No. 938,335

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1984, 3438113

Int. Cl.[5] B60T *8/10*

U.S. Cl. 303—97 **7 Claims**



1. A process for improving control during braking of a road vehicle by controlling the slip in the presence of different adhesive values on the right and left sides of the vehicle, wherein means are provided for detecting the rotational behavior of the vehicle wheels and the vehicular velocity to provide derived measured values in signal form and wherein the said signals are logically combined and processed and wherein, upon the instabilization of a wheel including the occurrence of a lock-up tendency, the signals independently control the braking force at said respective instable front wheel is kept at least constant and upon change in signal is thereafter reincreased, said process comprising the steps of evaluating the rotational behavior of the wheels (VR, VL, HR, HL) and the vehicular deceleration according to predetermined criteria manifesting the possibility of danger due to yawing moments which are capable of impairing the driving stability of the vehicle and wherein, when a predetermined yawing moment threshold value or a corresponding measured value is reached, restricting any further increase of the yawing moment by limiting the braking force, by keeping the braking force constant, or if the yawing moment continues by reducing said braking force, and by diminishing the degree of increase of the braking force at the front wheel which has a better contact with the road surface and further wherein the same said braking force is applied to the rear wheels (HR, HL) of the vehicle, wherein control of said braking force is a function of the slip signal of the rear wheel having a worse contact with the road surface, and wherein the deceleration (v_{HRh}) of the rear wheel with a better contact with the road surface is evaluated as a

measure of the vehicular deceleration when ascertaining the criteria for determining the yawing moment.

5,066,075

INTEGRATED ACTUATOR UNIT FOR ANTI-SKID BRAKE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

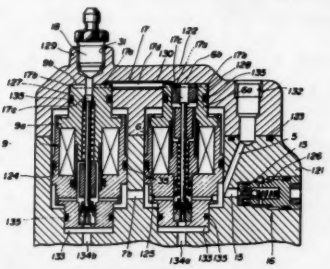
Ichiro Kaneda; Seiji Yamamoto, and Natsuji Fujii, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Dec. 26, 1989, Ser. No. 456,367

Claims priority, application Japan, Dec. 26, 1988, 63-168902[U]; Dec. 28, 1988, 63-170190[U]

Int. Cl.[5] B60T *8/32*

U.S. Cl. 303—113 R **18 Claims**



1. An integrated actuator unit for an anti-skid automotive brake system comprising:

a cast casing defining a first space for receiving an inlet valve assembly for introducing a braking pressure built in a master cylinder of a hydraulic brake circuit to a wheel cylinder, and a second space for receiving an outlet valve assembly for draining braking pressure in the wheel cylinder, said inlet and outlet valves being selectively operated to open and closed positions for adjusting braking pressure in said wheel cylinder;

and wherein said casing comprises a main body defining at one end open bores in a parallel relationship to each other, which bores serve as said first and said second spaces for receiving said inlet and outlet valves, and a cover member for sealingly closing the open ends of said bores;

and wherein said casing further defines a third bore extending essentially perpendicular to said first and second bores and internally communicated at least with said first bore, said third bore serving for receiving a pressure accumulator connected to an integrally formed path which is connected a drain line of said hydraulic circuit for receiving a pressurized fluid via a fluid pump, which accumulator is connected to said first space for supplying pressurized fluid via a path integrally formed with said casing; and

fluid flow path means integrally formed with said casing for communication with said hydraulic brake circuit and said first and second spaces.

5,066,076

APPARATUS FOR FIXING THE HYDRAULIC UNIT OF AN ABS AND/OR AN ASR IN THE MOTOR SPACE OF A STREET VEHICLE

Harry Tröster, Tamm, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

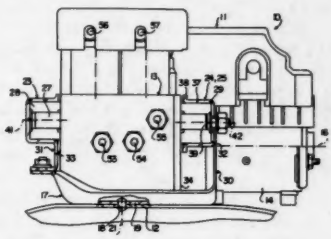
Filed Aug. 28, 1990, Ser. No. 573,692

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941401

Int. Cl.[5] B60T *8/00, 17/00;* B62D *27/06;* B60K *28/16*

U.S. Cl. 303—113 **6 Claims**

1. An apparatus for fixing a hydraulic unit of at least one of an antilock system (ABS) and a wheel slip control system (ASR) in a motor space of a street vehicle on the vehicle body of said street vehicle, said hydraulic unit, viewed in a longitudinal direction of the vehicle, being held between at least one forward and two rearward upwardly projecting legs of a console which is fixed on the vehicle body, characterized in that at least one holding element provided on the console and causing said fixing of the hydraulic unit against axial displacements has a defined low holding force which, starting from a specified minimum deceleration of the vehicle, is no longer sufficient for



holding the hydraulic unit fixed at the vehicle body, said minimum deceleration being clearly higher than vehicle decelerations occurring during a driving operation, but lower than longitudinal decelerations of the vehicle occurring in the case of an accident-caused impact of the vehicle on an obstacle which may lead to a deformation of the vehicle in an area of the apparatus itself.

5,066,077

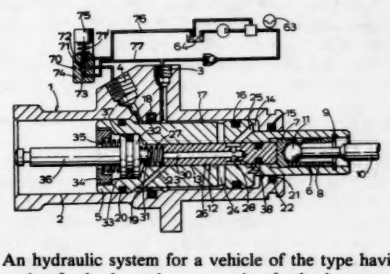
HYDRAULIC SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 10, 1989, Ser. No. 335,839

Int. Cl.[5] B60T *8/44*

U.S. Cl. 303—114 R **17 Claims**



1. An hydraulic system for a vehicle of the type having a front pair of wheels, and a rear pair of wheels, means for driving said wheels of a least one of said pairs, and an hydrualically actuated brake on each of said wheels, said system comprising a combined booster and hydraulic master cylinder assembly for applying all said brakes, said assembly having a pressure chamber, a reservoir for fluid, and a reservoir connection for connection to said reservoir, an hydraulic accumulator, a pedal for actuating said combined asdembly to apply said brakes normally for vehicle service retardation, a sensor for sensing the speed of rotation fo each said wheel, an electronic contorl module which receives signals from said sensor, means for controlling operation of at least one of said brakes, said means being actuated by sad control module whereby to control the behaviour of a respective wheel depending upon the nature and duration of the said signal, a servo-pressure control valve operative to control generation of servo assistance for said assembly in response to pressure generated by operation of said pedal, said servo-pressure control valve being movable between a first position in which said presure camber is in communication with said reservoir connection, and a second position in which said hydraulic accumulator is in communica-

tin with said pressure chamber to energise said pressure chamber, and an auxiliary control valve means responsive to a signal from said control module to energise said pressure chamber independently of operation of said servo-pressure control valve, said auxiliary control valve means being mvoable between a first position in which said reservoir connection is in communication with said reservoir, and a second position in which said reservoir connection is in communication with said hydraulic accumulator, and wherien a first hydraulic circuit is provided for said booster and comprises said pressure chamber, said reservoir, said reservoir connector, said accumulator, said servo pressure control valve, and said auxiliary valve control means; and a second independent hydraulic circuit is provided for said master cylinder and said means for controlling operation of at least one of said brakes, there being no mixing of the hydraulic fluid between the two circuits.

5,066,078

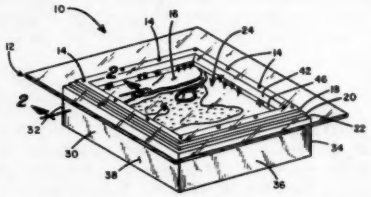
FURNITURE TOP INSERT FEATURING LANDSCAPE

Michael Wurst, 6205 S. Knoll Dr., Edina, Minn. 55436

Filed Dec. 13, 1990, Ser. No. 626,786

Int. Cl.[5] **A47F** *3/00;* **312** *204, 223, 114, 242;* **108** *23;* **40** *160*

U.S. Cl. 312—114 **9 Claims**



1. A furniture item for displaying a scale, three-dimensional model of a scene comprising in combination:

(a) a box-like enclosure sealed from an ambient including a floor panel with four mutually perpendicular side walls extending upwardly therefrom, each having a top edge and a bottom edge, and an upper edge surface extending from said top edge of said side walls, the upper edge surface having an inner periphery including a rectangular notch;

(b) a rigid transparent sheet having its edges fitted into said rectangular notch;

(c) a three-dimensional scaled replica of a prominent geographical scene resting on and substantially covering said floor panel beneath said rigid transparent sheet; and

(d) a rigid, inflexible transparent top member disposed in spaced apart but covering relation with respect to said rigid transparent sheet.

5,066,079

DOOR SAFE APPARATUS

James L. Lawrence, Rt. 6, Box 158M, Petersburg, Va. 23803

Filed May 29, 1990, Ser. No. 529,563

Int. Cl.[5] **A47B** *17/04*

U.S. Cl. 312—204 **1 Claim**

1. A door safe apparatus comprising in combination,

a door, the door including a forward door wall spaced from and parallel a rear door wall, and

the door including a rear end wall spaced from and parallel to a forward end wall, the forward end wall including a latch member mounted therewithin, and

a door cavity formed within the door positioned below the latch member, the door cavity including a slot directed through the forward end wall, and

a cover flap removably mounted in alignment with the forward wall covering the slot in a first position and displaceable to a second position orthogonally oriented relative to the forward wall removed from the slot, and

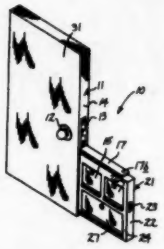
a security container mounted within the cavity selectively removable therefrom through the slot, and

wherein the cover flap includes a securement clasp to secure the cover flap in alignment with the forward end wall, and

wherein the door cavity includes a first and second "U" shaped guide, the first and second "U" shaped guide mounted within the door cavity above the container, and each of the "U" shaped guides arranged in confronting relationship to slidably receive the cover flap therewithin to secure the cover flap in the second position displaced relative to the slot, and

wherein the container includes a container forward wall and a plurality of door members mounted in the container forward wall, each door member including a latch to secure each door member to the container, and

wherein the container includes a container rear wall spaced from the forward wall, an upper and lower "T" shaped projection, the "T" shaped projections mounted to the container rear wall spaced apart a predetermined spacing,



and the rear door wall including an upper and lower track, the upper and lower track are arranged parallel relative to one another and spaced apart the predetermined spacing to respectively receive in a slidable relationship the upper and lower "T" shaped projections within each upper and lower track respectively, and

wherein each upper and lower track includes a "T" shaped slot, each "T" shaped slot of a complementary configuration to each "T" shaped projection, and

wherein each door member includes a hinge, each hinge pivotally mounting each door member to the container, and each container further includes a latch member to selectively secure each door member to the container, and

wherein the container includes a container forward end wall wherein the container forward end wall includes a handle mounted thereon to permit selective removal of the container relative to the door cavity, and

wherein the door cavity includes a door cavity floor, the door cavity floor arranged parallel to the upper and lower tracks wherein the container is spaced above the floor.

5,066,080

TAMBOUR DOOR AND METHOD OF MAKING

Bruce Woodward, Anchorage, and James Hall, Louisville, both of Ky., assignors to National Products, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 270,103, Nov. 14, 1988, abandoned. This application Aug. 16, 1989, Ser. No. 393,686

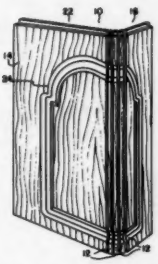
Int. Cl.[5] **E06B** *9/15*

U.S. Cl. 312—297 **10 Claims**

1. A tambour door comprising:

a plurality of elongated parallel wood members, each member having a rectangular-shaped transverse cross-section, a front surface, a back surface, and sides substantially perpendicular to the front surface, the adjacent elongated members being aligned in an abutting side-by-side relationship, the elongated members having been cut from a single panel of wood and oriented in the same relationship are to the other as they were when originally cut from the wood panel with the sides of the elongated members

remaining unfinished as originally cut from the wood panel such that the grain of the wood of each elongated member substantially mates with the grain of the wood of an adjacent elongated member at the interface therebetween whereby the interfaces between adjacent members



is indistinct, and the front surfaces of the individual elongated members cooperate forming a planar overall surface providing an appearance of a solid panel; and,

a flexible backing material coextensive with the plurality of side-by-side elongated members adhesively attached to the back surfaces of the elongated members.

5,066,081

BLOW-MOLDED BOTTLE WITH BI-AXIALLY STRETCHED SKIRT

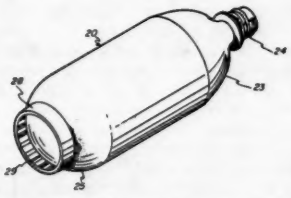
Harold D. Bartley, Springfield, and William R. Gaiser, Dayton, both of Ohio, assignors to Broadway Companies, Inc., Dayton, Ohio

Division of Ser. No. 325,169, Mar. 17, 1989, Pat. No. 4,952,134, which is a continuation-in-part of Ser. No. 157,449, Feb. 19, 1988, Pat. No. 4,861,260. This application Jul. 17, 1990, Ser. No. 554,214

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] B65D *1/02, 23/00*

U.S. Cl. 215—1 C **2 Claims**



2. A blow-molded, carbonated beverage bottle formed of PET material having a threaded neck portion, a tubular and generally cylindrical body side wall portion, and a curved closure bottom of generally spherical shape, comprising:

a single thickness bi-axially stretched skirt formed as an integral portion of said bottom and extending from a location on said bottom radially inwardly of said body side wall portion in an axial direction with respect to the axis of said bottle, and terminating in a lower surface defining a common plane thereby forming a support for supporting said bottle in an upright position,

said skirt further being defined by an inwardly turned ledge at said lower surface.

5,066,082

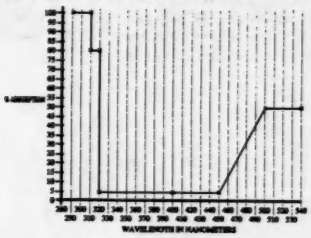
SUNBATHING FILTER WITH INCOMPLETE UV-B ABSORPTION

Eric Longstaff, Atlanta, Ga., assignor to B.V. Interlad, Netherlands

Continuation of Ser. No. 232,145, Aug. 15, 1988, abandoned, which is a continuation of Ser. No. 930,602, Nov. 13, 1986, Pat. No. 4,793,668. This application Sep. 21, 1990, Ser. No. 586,406

Int. Cl.[5] G02B *5/22*

U.S. Cl. 359—361 **2 Claims**



1. A solar radiation filter for promoting sunbathing, which:

is substantially transparent to the safe wavelengths of UV-A radiation in the range 320–400 nm and to light in the range 400–450 nm;

absorbs at least 80% of the UV-B radiation in the range 310–320 nm;

absorbs substantially all UV-B radiation in the range 290–310 nm; and

prevents transmittal of a biologically significant proportion of the visible radiation in the range 450–700 nm and of the IR radiation in the range 700–15,000 nm,

wherein the relatively small portion of UV-B not absorbed stimulates the production of new melanin in a sunbather, which will be later available for tanning by UV-A radiation.

5,066,083

SCANNING OPTICAL SYSTEM

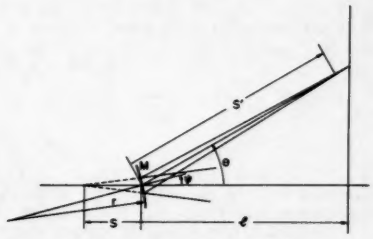
Jun Makino, and Masamichi Tateoka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 332,041, Apr. 3, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 639,386

Claims priority, application Japan, Apr. 5, 1988, 63-84490; May 17, 1988, 63-121090

Int. Cl.[5] G02B *26/08*

U.S. Cl. 359—213 **17 Claims**



1. A scanning optical system comprising:

a light source;

a lens for converging a light beam from said light source; and

a deflector for deflecting the converged light beam from said lens in a predetermined direction, said deflector having a deflection/reflection surface which sinusoidally oscillates,

wherein when a maximum deflection angle of said deflector

is represented by ψ_{max} a within a deflection plane of said deflector, the following condition is satisfied:

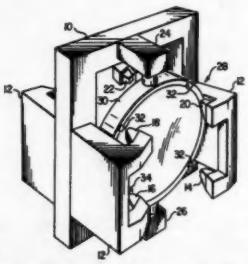
$$38° \leq \psi_{max} \leq 50°$$

5,066,084

CONSTANT VELOCITY SCANNING APPARATUS

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 6, 1989, Ser. No. 306,351
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—213 **9 Claims**



1. Mirror scanning apparatus comprising, in combination:
base support means;
mirror means pivotally attached to said support means for operating in substantially constant velocity scanning cycles between given angular extremes and including indicia for facilitating the detection of pivotal positioning information of the mirror relative said base support means;
a plurality of combination impact protection means and adjustable direction thrust supplying means for measuring the impact of said mirror means at its travel extreme in a given half of a scan cycle and for supplying an appropriate thrust to said mirror means to return said mirror means to its design velocity for the other half of the scan cycle;
position detecting means mounted in a stationary position relative said base support for providing position signals indicative of angular position of said mirror means relative said base support means; and
control means connected to said impact detection means and said position detecting means for receiving position and impact information therefrom and supplying thrust signals to said thrust supplying means to control the movements of said mirror means whereby substantially constant scan velocity of said mirror means is provided over a given range of movement.

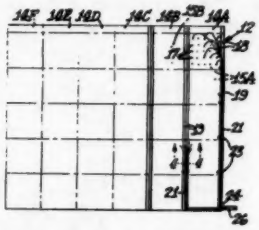
5,066,085

FIBER OPTIC CURTAIN

Aidas Gimbutas, and Marion Gimbutas, both of Wilmington, Del., assignors to Main Light Inc., Wilmington, Del.

Filed Oct. 9, 1990, Ser. No. 594,634
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—115 **9 Claims**

1. A fiber optic curtain, comprising:
a cloth panel having a front face and a rear face; and
a fiber optic strand having a tip at one end with the tip inserted into a hole through the cloth panel from the rear face and secured with adhesive applied around the strand at the rear face of the panel so that the tip is substantially perpendicular to and substantially flush with the front face



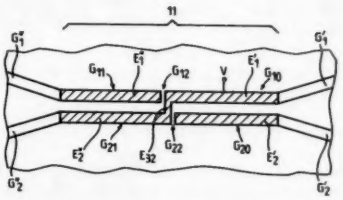
of the cloth and the other end of the fiber optic strand is connected to a light source.

5,066,086

SEMICONDUCTOR DEVICE COMPRISING A DIRECTIONAL COUPLER FOR THE TE AND TM COMPONENTS

Johannes Angenent, Paris, and Jean A. Cavailles, Saint-Mande, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 20, 1990, Ser. No. 558,116
Claims priority, application France, Jul. 28, 1989, 89 10189
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—41 **10 Claims**



1. An integrated semiconductor device including a directional optoelectronic coupler, which coupler comprises two parallel single-mode rectilinear radiation waveguides over a total length D, separated by a small so-called coupling distance d, of which waveguides at least one receives a radiation signal at its so-called input end the coupler further comprising four electrodes of the same conductivity type disposed two by two on each waveguide and at least one other electrode of the opposite conductivity type to permit of the creation of an electric field in the waveguides and, depending on the value of the said electric field, of the passage of the radiation into the waveguide opposed to the input waveguide, which corresponds to the so-called crossover state of the coupler, or of its propagation in the extended direction of entrance, which corresponds to the so-called straight-through state of the coupler, characterized in that the coupler has an operation which is independent of the transverse electrical and transverse magnetic radiation components, TE and TM respectively, present in random proportions in the incoming signal, under the conditions in whcih the structural parameters of the coupler render it possible to ensure that the following relations are true:

$$Z = D/2 \quad \text{(a)}$$

$$\phi_{TE} \cdot L_{CTE} = \phi_{TM} \cdot L_{CTM} \quad \text{(b)}$$

$$L_{CTM}/L_{CTE} = (1 - m/n)/\epsilon = k \quad \text{(c)}$$

$$D/L_{CTM} = [p\sqrt{8}\ /(1 - \epsilon k)]\{1/|\sin[p \cdot \pi/(1 - \epsilon k)]|\} \quad \text{(d)}$$

In which relations:
Z is the dimension of the electrodes on the waveguides,

ϕ_{TM} and ϕ_{TE} are the phase mismatches provoked by the refractive-index changes in the waveguides under the influence of an electric field for the TM component and the TE component, respectively,

L_{CTE} and L_{CTM} are the lengths necessary for the given polarization components, TE or TM, respectively, introduced into a waveguide to pass into the other waveguide, called hereinafter coupling length for TE and coupling for TM,

m, n, p are random integer numbers,

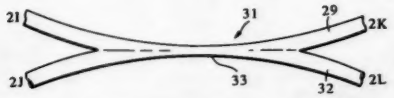
$\epsilon = \pm 1$.

5,066,087

OPTICAL FIBER COUPLER

Ryozo Yamauchi, Sakura; Noboru Kawakami, Chiba, and Fumio Suzuki, Sanbu, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 7, 1990, Ser. No. 490,026
Int. Cl.[5] G02B 6/26
U.S. Cl. 385—43 10 Claims



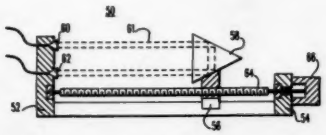
1. An optical fiber coupler formed by fusing a section of each of two or more component optical fibers, and then elongating the fused section to form a fused-elongated region in which at least one of said component optical fibers is a single mode optical fiber having a parameter range such that as the diameter of the core of said optical fiber is reduced, the diameter of the mode field for said optical fiber increases monotonically.

5,066,088

OPTICAL VARIABLE DELAY LINE AND VARIABLE-FREQUENCY FIBER-OPTIC MULTIPLEXER

David K. Davies; Peter J. Chantry, both of Churchill, and Anastasios P. Goutzoulis, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1990, Ser. No. 572,835
Int. Cl.[5] G02B 6/32
U.S. Cl. 385—25 10 Claims



1. A high frequency optical delay line device comprising:

(a) mounting means having a carriage unit, first and second end segments provided on opposite ends of said carriage unit;

(b) a collimating lens secured to said mounting means, said collimating lens connected to a first optical fiber transmitting a signal, said collimating lens producing a collimated beam;

(c) a focusing lens secured to said mounting means and positioned to receive said collimated beam, said focusing lens connected to an optical fiber collector which collects said collimated beam and transmits it through a second optical fiber;

(d) adjustment means provided on said mounting means adapted to adjust the distance travelled by said collimated beam;

(e) a carrier provided in said carriage unit; and

(f) a reflecting means secured to said carrier, said reflecting means positioned to reflect said collimated beam from said collimating lens to said focusing lens;

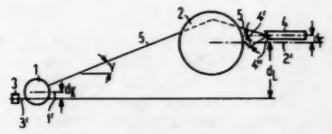
whereby the adjustment of said distance travelled by said collimated beam produced a change in the delay time.

5,066,089

ARRANGEMENT FOR OPTICALLY COUPLING LIGHT BETWEEN AN ELECTRO-OPTICAL TRANSDUCER AND A LIGHT WAVEGUIDE

Andreas Greil, Munich, and Joachim Bialas, Deisenhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,118
Claims priority, application Hague, May 29, 1989, 89 109671
Int. Cl.[5] G02B 6/32
U.S. Cl. 385—35 6 Claims



1. An arrangement for optically coupling an electro-optical transducer to a light waveguide, comprising:

first and second lenses each having an optical axis, said first lens being arranged in front of the electro-optical transducer and said second lens being arranged in front of the light waveguide, said optical axis of said first lens being axially offset relative an optical axis of the electro-optical transducer, said optical axis of said second lens being axially offset relative to an optical axis of the light waveguide, said optical axis of said first lens being offset relative to said optical axis of said optical axis of said second lens, and

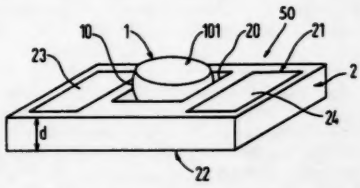
an end face of the light waveguide directed toward said second lens is being inclined at a bevel angle relative to the optical axis of the light waveguide.

5,066,090

OPTICAL COUPLING ELEMENT HAVING A CONVEX MICROLENS AND THE METHOD OF MANUFACTURE

Franz Mayerhofer, Puchheim; Holger Karstensen, Hohenbrunn; Ralf Dietrich, Munich, and Werner Spaeth, Holzkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 20, 1990, Ser. No. 569,624
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1989, 3930433
Int. Cl.[5] G02B 6/32; B29D 11/00; B24B 1/00
U.S. Cl. 385—35 11 Claims



1. A method for manufacturing an optical coupling element having a microlens mounted in a through-hole having a shape of a truncated cone in a carrier lamina with a flattened surface extending parallel to one of the surfaces of the carrier, said method comprising the steps of providing a carrier lamina,

forming a through-hole having a shape like a truncated cone in the carrier lamina, securing a ball of transparent material in the through-hole with a portion of the ball projecting at least above one flat surface of the carrier lamina to form a spherical cap, and then processing the spherical cap to form a planar surface in the ball extending parallel to the one flat surface of the carrier lamina.

5,066,091

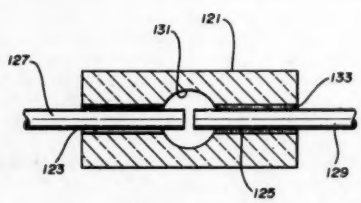
AMORPHOUS MEMORY POLYMER ALIGNMENT DEVICE WITH ACCESS MEANS

George P. Stoy, South Brunswick Township, Middlesex County, N.J.; Francis T. Delahanty, Newtown Township, Bucks County, Pa., and Vladimir A. Stoy, Princeton, N.J., assignors to Kingston Technologies, Inc., Dayton, N.J.

Continuation-in-part of Ser. No. 288,629, Dec. 22, 1988, Pat. No. 4,921,323. This application Mar. 12, 1990, Ser. No. 493,102

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—98 63 Claims



1. A device for precision alignment of two or more articles with the device permitting access to said articles, which comprises:

a unistructural mass of inherent shape memory material having three dimensions and having at least two cavity-containing ends which include a first cavity at one of said cavity-containing ends formed into the inside of said mass, and a second cavity at another of said cavity-containing ends formed into the inside of said mass to and in a predetermined alignment with said first cavity and at least one separate access cavity formed into said mass and intersecting with at least one of said first or second cavity, said mass having a first shape and a second shape:

(a) said first shape being a unique, recoverable, predetermined inherent shape wherein said first cavity and said second cavity each have a preset cross-sectional configuration to accommodate and tightly hold at least a portion of articles to be aligned with one another; and,

(b) said second shape being a deformed and enlarged shape of said inherent memory material wherein said first cavity and said second cavity each have an enlarged predetermined cross-sectional configuration greater than the cross-sectional configurations of the portions of the articles to be held so as to loosely and freely receive said portions of said articles;

said mass of inherent shape memory material being in said second shape and being capable of being returned to said first shape for precision alignment of said two or more articles by application of a non-mechanical stimulus to said mass.

5,066,092

OPTICAL ARRANGEMENT FOR A FEEDBACK-FREE COUPLING OF A LASER EMISSION EMITTED BY A SEMICONDUCTOR LASER INTO AN OPTICAL FIBER

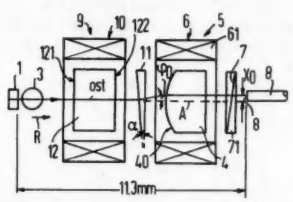
Karsten Droegemueller, Feldkirchen-Westerham, and Ekkehard Klement, Graefelfing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 6, 1990, Ser. No. 578,418

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931380

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—33 6 Claims



1. An optical arrangement for a feedback-free coupling of a laser emission divergently emitted by a semiconductor laser into an optical fiber, said arrangement including a first optical lens for receiving the laser emission, a second optical lens arranged following the first lens in the propagation direction of the laser emission and a first optical isolator being arranged in a beam path of the laser emission, said first optical isolator being composed of a Faraday rotator and at least a first polarizer, wherein the second lens being a component part of the Faraday rotator, the improvements comprising a second optical isolator being arranged between the first lens and the first optical isolator, said second optical isolator being composed of a second Faraday rotator and of a second polarizer that has a higher blocking attenuation than a blocking attenuation of the first polarizer.

5,066,093

METHOD FOR ADJUSTING AND FIXING A LENS AND OPTICAL COUPLING ARRANGEMENT MANUFACTURED THEREWITH

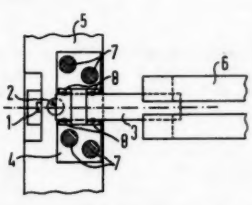
Andreas Greil, and Franz Taumberger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,448

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1989, 3909552

Int. Cl.[5] G02B *6/32*

U.S. Cl. 385—33 19 Claims



9. An arrangement for optically coupling an optical electronic component to an optical lens that is adjusted and fixed on a carrier in front of an optical electronic component, said arrangement comprising a carrier having an opto-electronic component mounted on a surface thereof, a lens being held in an end face of a small metal tube, a metal clip for holding the small metal tube on the carrier in an adjusted position with the lens positioned in front of the opto-electronic component, said clip being welded to the carrier and said metal tube together

with the lens being secured in the metal clip by a spot welding between the clip and tube

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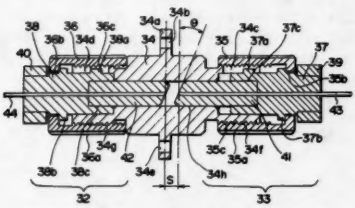
5,066,094

VARIABLE OPTICAL FIBER LIGHT ATTENUATOR

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Matsudo, Japan

Filed Feb. 7, 1991, Ser. No. 655,134
Claims priority, application Japan, Sep. 7, 1990, 2-238737
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—73 9 Claims



1. A variable light attenuator which transmits light power from first to second optical fibers through first and second ferrules after attenuating it by a specified ratio of light power when the light power input from the first optical fiber to first ferrule is transmitted to second optical fiber through second ferrule which is coupled with the first ferrule via an intermediate air gap for use in optical power attenuation comprising:

an alignment adapter which provides an alignment through hole concentrically passing therethrough along the optical axis thereof;

first ferrule fastening means which fastens the first ferrule whose edge is exposed to the intermediate air gap together with the edge of the first optical fiber and is a certain degree inclined to the optical axis, passes the first ferrule through the alignment through hole, and then fastens the first ferrule to the alignment adapter; and

second ferrule fastening means which fastens second ferrule whose edge is exposed to the intermediate air gap together with the edge of the second optical fiber is inclined to the optical axis thereof the same degrees as those of the first ferrule, inserts the second ferrule to the alignment through hole in the opposite side to that whereto the first ferrule is inserted, advances the second ferrule toward the first ferrule without revolving the second ferrule, and sets the gap between the first and second ferrules at an arbitrary value while keeping the edge of the first ferrule together with the edge of the first optical fiber in parallel with the edge of the second ferrule together with the edge of the second optical fiber.

5,066,095

JOINTING BOX FOR OPTICAL FIBER CABLES

Bernard Dekeyser, Dunkerque, and Roland Troude, Calais, both of France, assignors to Alcatel Cable, Cedex, France

Filed Feb. 8, 1991, Ser. No. 652,711
Claims priority, application France, Feb. 9, 1990, 90 01535
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—99 5 Claims

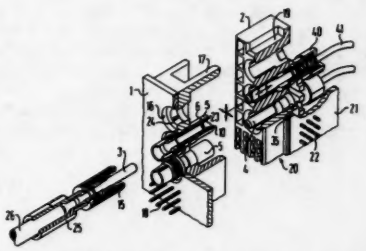
1. Jointing box for optical fiber cables received over a sheath jointing two cables, comprising two flanges which are generally funnel-shaped, each having a larger diameter first cylindrical part and a smaller diameter second cylindrical part joined by an intermediate frustoconical part, inserted over the opposite end parts of said sheath, said flanges covering said sheath at least partially and surrounding the adjacent areas of said cables, on each respective side of said sheath, and comprising a first heat-shrink material tube shrunk onto the larger diameter first cylindrical part of the flanges and sealing means between the smaller diameter second cylindrical parts of the flanges and said cables, wherein said flanges are provided with peripheral circular grooves on the external surface of said first and second cylindrical parts, said first tube is coated on its inside surface with a sealing material and said sealing means comprise two second heat-shrink material tubes coated on their inside surface with sealing material and adapted to be shrunk onto the smaller diameter second cylindrical part of said flanges and onto said adjacent areas of said cables.

5,066,096

LIGHT WAVEGUIDE PLUG-TYPE CONNECTOR

Peter Krausse, Aschheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 13, 1991, Ser. No. 654,520
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 90001866[U]
Int. Cl.[5] G02B *6/38*
U.S. Cl. 385—58 8 Claims



1. A light waveguide plug-type connector for a rack mounting having two hybrid equipment strips, said connector comprising a first plug, a second plug and a centering sleeve, said centering sleeve being received in a receptacle tube, said tube being mounted in one of the two strips by a threaded sleeve being threadably received into one end of the tube, said first plug being fixably mounted on said one strip and extending into said centering sleeve and means for mounting the second plug on the other strip of the two strips for axial movement, said means for mounting including a spring so that when the two strips are brought together, the second plug extends into the centering sleeve to be centered relative to the first plug and can yield as ends of the two plugs engage each other.

5,066,097

CONNECTOR FOR AN OPTICAL CABLE

Hubert Brändle, Otelfingen; Lothar Schultheis, Fislisbach, and Walter Rüegg, Endingen, all of Switzerland, assignors to ASEA Brown Boveri Ltd., Baden, Switzerland

Filed Aug. 14, 1990, Ser. No. 566,767
Claims priority, application Switzerland, Sep. 14, 1989, 3362/89
Int. Cl.[5] G02B *6/40*
U.S. Cl. 385—76 10 Claims

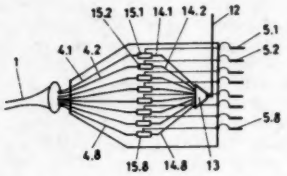
1. A connector for an optical cable having a plurality of glass fibers for signal transmission, comprising:

a plurality of electrical plug contacts;

first means for converting an electrical signal into an optical signal, having an electrical side in which said plurality of electrical plug contacts are disposed and an optical side in which said plurality of glass fibers are disposed, such that each of said plurality of electrical plug contacts is coupled to a corresponding one of said plurality of glass fibers, and

having a plurality of integrated optical switches controlled by electrical signals applied to said electrical plug contacts; and

a common light source for providing light to said plurality of



glass fibers for signal transmission, said light being distributed from the common light source to said plurality of integrated optical switches and controllably transmitted to said plurality of glass fibers by said integrated optical switches.

5,066,098

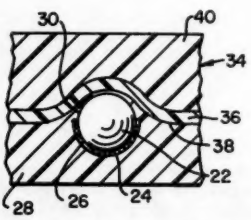
CELLULAR ENCAPSULATED-LENS HIGH WHITENESS RETROREFLECTIVE SHEETING WITH FLEXIBLE COVER SHEET

Roger R. Kult, Maplewood; Terry R. Bailey, and Howard R. Tolliver, both of Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 532,175, Jun. 4, 1990, abandoned, which is a continuation of Ser. No. 423,514, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 50,620, May 15, 1987, abandoned. This application Feb. 19, 1991, Ser. No. 657,874

Int. Cl.[5] G02B *5/128*

U.S. Cl. 359—540 **29 Claims**



1. A cellular, encapsulated-lens retroreflective sheeting comprising: (1) a base sheet that comprises a monolayer of retroreflective elements partially embedded in a binder layer; (2) a cover sheet disposed in spaced relation from the layer of retroreflective elements; and (3) a network of narrow intersecting bonds that extend between said cover sheet and said base sheet and comprise binder material thermoformed at the point of contact between said bonds and said cover sheet so as to adhere said base sheet and said cover sheet together and from a plurality of cells within which retroreflective elements are hermetically sealed;

wherein the cover sheet comprises an inner layer and at least a structural layer, said inner layer having an inside major surface that is in adherent contact with said intersecting bonds, and an outside major surface adhered to said structural layer of said cover sheet, and said inner layer having a Vicat Softening point of at least said structural layer of said cover sheet, said Vicat Softening Point of said inner layer also being higher than the minimum temperature at which said binder material was thermoformable into contact with said cover sheet, such that said inner layer improved the interaction between said cover sheet and said retroreflective elements so that when said binder material was thermoformed into contact with said cover sheet the flow of said binder material around the front surfaces of said retroreflective elements was improved.

5,066,099

REAR PROJECTION SCREEN AND METHOD OF PRODUCING THE SAME

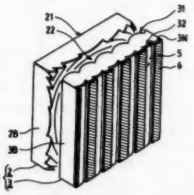
Takahoko Yoshida, Miura; Masayuki Muranaka, Yokohama; Hiroki Yoshikawa, Hiratsuka; Koji Hirata, Kamakura; Isao Yoshizaki, Yokohama; Masakuni Teratani, Setagaya, and Nobuhiro Konuma, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,854

Claims priority, application Japan, Apr. 26, 1989, 1-104435

Int. Cl.[5] G03B *21/60*

U.S. Cl. 359—457 **24 Claims**



1. A rear projection screen comprising one or more sheet members, wherein a base constituting the last sheet member, through which light transmitted sequentially through the sheet members from the side of a plane of incidence is transmitted last, comprises a transparent material, and a light diffusing layer is provided at a plane of emergence of the last sheet member, the light diffusing layer including a light diffuser and a transparent binder, the transparent binder having a refractive index different from a refractive index of the light diffuser and being at least one of an ultraviolet curable material and a colored material.

5,066,100

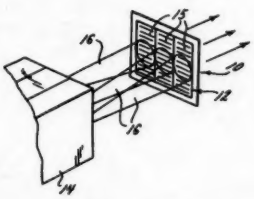
BINARY ALIGNMENT CORRECTOR

Ronald A. Ferrante, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 24, 1990, Ser. No. 632,928

Int. Cl.[5] G02B *5/18*

U.S. Cl. 359—569 **6 Claims**



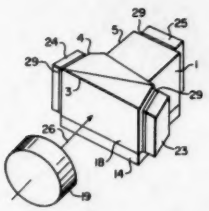
5. An apparatus for aligning a plurality of laser beams, comprising a plurality of diffraction gratings wherein each individual diffraction grating corresponds to an individual laser beam and has a grating period selected to compensate for the angular misalignment of the corresponding individual laser beam.

5,066,101

COLOR SEPARATION OPTICAL SYSTEM AND METHOD OF MANUFACTURING THE SAME

Shinichiro Aoki, Kawasaki; Koichi Kawata, Tokyo; Yasuyuki Morita, Yokohama; Akitoshi Mori, Kawasaki; Yuji Hashidate, Tokyo; Tatsuki Tsukada, Yokohama, and Hiroshi Nakamura, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 193,614, May 13, 1988, Pat. No. 4,890,899.
This application Oct. 17, 1989, Ser. No. 422,712
Claims priority, application Japan, May 18, 1987, 62-120469; May 18, 1987, 62-120471; May 18, 1987, 62-120472; May 29, 1987, 62-135232
Int. Cl.[5] G02B 27/14, 5/04
U.S. Cl. 359—638 3 Claims



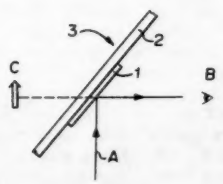
1. A color separation optical system comprising:
a base;
a set of prisms separating incident light into components having different wavelengths, the prisms having a predetermined thermal expansion coefficient;
means for fixing the prism set to the base;
image pickup devices exposed to the respective light components and having a predetermined thermal expansion coefficient which differs from the thermal expansion coefficient of the prisms; and
means for bonding the image pickup devices to the prism set;
wherein the bonding means comprises means for compensating a difference in thermally induced deformation quantity between the image pickup devices and the prisms to maintain a positional relation between the image pickup devices and the prisms.

5,066,102

COMBINER FOR HEAD-UP DISPLAY AND GLASS WITH DURABLE REFLECTIVE COATING

Akira Hirano, Yokohama, Japan, assignor to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,630
Claims priority, application Japan, Oct. 9, 1989, 1-117962[U]; Dec. 26, 1989, 1-334857
Int. Cl.[5] G02B 27/14, 5/26, 1/10
U.S. Cl. 359—630 10 Claims



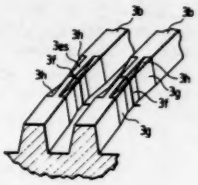
1. A combiner for head-up display comprising a combiner part which comprises a coating formed on a part of a surface of a windshield glass, said combiner part having a difference between a maximum reflectance and a minimum reflectance at the surface of said coating of not more than 5% in a wavelength range of 100 nm within the visible light region, said combiner part having a visible light reflectance, with an incident angle of approximately 0°, in a range of from 9 to 18% and a visible light transmittance of at least 70%, said coating being a composite oxide of Ti, Ta and Si.

5,066,103

HELICOID THREADED TUBE OF SYNTHETIC RESIN AND LENS BARREL COMPRISING IT

Yoshiro Kodaka, Tokyo, and Kiyonobu Takabayashi, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,561
Claims priority, application Japan, Nov. 29, 1988, 63-299658
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—823 6 Claims



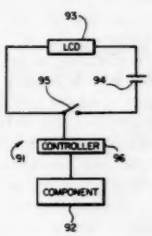
4. A lens barrel, comprising:
a male helicoid threaded tube and a female helicoid threaded tube which are engageable together by means of the threads thereof, at least one of said male and female threaded tubes comprising:
a hollow cylindrical member of synthetic resin formed by molding a synthetic resin by means of a split mold having matching surface;
primary threads of predetermined height integrally formed with the cylindrical member and helically extending on the inner or outer surface thereof and having a cross section which is substantially trapezoidal at all portions thereof except split line segments thereof where the matching surfaces of the split mold intersect with the cylindrical member; and
relief thread portions centered at the split line segments and continuously extending from the primary threads with a gradually narrowing width, the relief thread portions having a height substantially equal to that of the primary threads.

5,066,104

LIQUID CRYSTAL ELECTRICAL FAULT INDICATORS

Manoochehr Mohebban, Foster City; Wayne Montoya, Newark; Robert Parker, Alamo, and Dennis C. Siden, Portola Valley, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Mar. 25, 1988, Ser. No. 173,407
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—43 18 Claims



1. An electrical apparatus having a liquid crystal fault indicator, comprising:

an electrical component subject to electrical fault;

a smectic liquid crystal display having an indicating element having a first and second visual state, said indicating element being capable of transitioning from the first to the second visual state upon the application of an electrical field sufficient to realign the smectic liquid crystal material contained therein and remaining in the second visual state after the removal of the electrical field and further being capable of transitioning from the second to the first visual state upon heating to at least a delatching temperature T_d sufficient to destroy the electric field induced alignment of the smectic liquid crystals and to cause the indicating element to revert to its first visual state upon cooling to ambient temperature; and

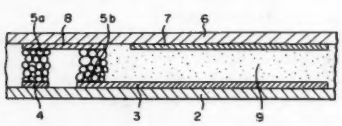
fault signal means in the form of an electrical connection between said liquid crystal display and said electrical component and responsive to the fault state of said electrical component and capable of providing, upon the occurrence of a fault, an electrical signal sufficient to cause said indicating element to transition from a visual state indicative of an unfaulted condition to a visual state indicative of a faulted condition.

5,066,105

LIQUID CRYSTAL DISPLAY DEVICE HAVING VARISTOR LAYERS SUBSTANTIALLY FREE FROM CROSS-TALK

Hataaki Yoshimoto, Chiba, and Katsuhiro Ito, Ichihara, both of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Oct. 17, 1990, Ser. No. 599,114
Claims priority, application Japan, Oct. 18, 1989, 1-268999
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—58 **8 Claims**



1. A liquid crystal display device comprising:

a first transparent base;

a plurality of picture element electrodes arranged on the first base;

a plurality of signal lines for supplying electric signals to the picture element electrodes and arranged adjacent to and spaced from the picture element electrodes on the first base;

a second transparent base arranged in parallel to and spaced from the first base;

a plurality of scanning electrodes arranged on the second base and facing and spaced from the picture element electrodes;

a plurality of transit electrodes arranged on the second base, facing and spaced from the corresponding signal lines and the picture element electrodes on the first base and spaced from the scanning electrodes on the second base;

a liquid crystal material layer arranged between the picture element electrodes and the scanning electrodes; and

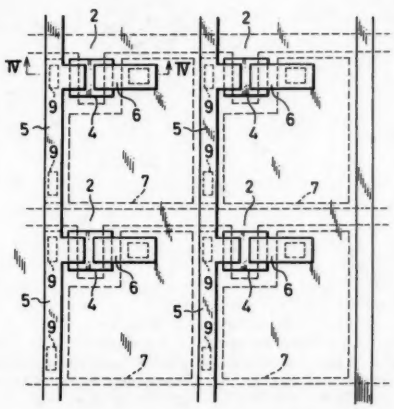
a plurality of varistor layers comprising fine varistor particles and each extending from at least one of the corresponding picture element electrode and signal line to the corresponding transit electrode to electrically connect the picture element electrodes to the signal lines through the varistor layers and the transit electrodes.

5,066,106

LIQUID CRYSTAL DISPLAY DEVICE HAVING REDUNDANT BUSES

Hirokazu Sakamoto; Makoto Ohtani; Naoki Nakagawa; Taro Maejima, and Masahiro Hayama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,763
Claims priority, application Japan, Jan. 27, 1988, 63-17808
Int. Cl.[5] G02F *1/133*; H01L *27/01*
U.S. Cl. 359—59 **5 Claims**



2. A liquid crystal display device comprising:

a transparent insulating substrate;

a transparent conductive film disposed on said substrate;

a display electrode disposed on said transparent conductive film;

a plurality of spaced apart gate electrode conductors disposed on said substrate;

a gate electrode extending from one of said gate electrode conductors and disposed on said substrate;

a gate insulation film disposed on said gate electrode, said gate electrode conductors, and said display electrode;

a semiconductor film disposed on said gate insulation film overlying said gate electrode;

a plurality of spaced apart source conductors disposed on said gate insulation film, crossing and insulated from the gate electrode conductors by said gate insulation film;

a drain electrode electrically connected to and disposed on part of said display electrode and said semiconductor film and disposed on part of said gate insulation film;

a plurality of lower layer source conductors formed simultaneously with said gate electrode conductors and disposed on said substrate; and

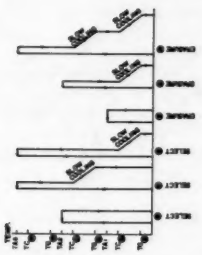
a source electrode electrically connected to one of said source conductors, electrically connected to and disposed on said semiconductor film, and disposed on part of said gate insulation film wherein said gate insulation film includes a plurality of openings, each opening being disposed beneath one of said source conductors, extending to a respective lower layer source conductor, spaced from and adjacent to a gate conductor where said gate conductor crosses the respective source conductor, a portion of the respective source conductor filling each of the respective openings in electrical contact with said respective lower layer source conductor.

5,066,107

LIQUID CRYSTAL DISPLAY MEDIUM, LIQUID CRYSTAL DISPLAY METHOD AND LIQUID CRYSTAL DISPLAY APPARATUS FOR OUTPUTTING COLOR IMAGES

Kazuo Yoshinaga, Machida; Shuzo Keneko, Yokohama; Takashi Kai, Hadano; Kazuo Isaka, and Toshikazu Ohnishi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1989, Ser. No. 365,721
Claims priority, application Japan, Jun. 16, 1988, 63-146794; Jun. 16, 1988, 63-146795; Jun. 16, 1988, 63-146796
Int. Cl.[5] G02F 1/33
U.S. Cl. 359—45 19 Claims



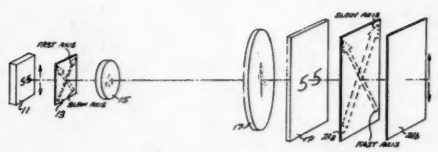
1. A liquid crystal display medium having a display face and comprising a plurality of display layers laminated parallel to the display face, each display layer comprising a polymer liquid crystal having a mesomorphic temperature range between its glass transition temperature and the upper limit temperature of a liquid crystal phase for display, wherein the mesomorphic temperature ranges of said plurality of display layers do not overlap each other.

5,066,108

HIGH THROUGHPUT CONTRAST ENHANCEMENT FOR POLARIZED DISPLAYS

Mark E. McDonald, Plays del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 22, 1989, Ser. No. 455,115
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—65 2 Claims



1. A polarized display comprising:

a display source for producing source imaging illumination that includes linearly polarized imaging illumination;

a first quarter-wave retarder having a fast axis for transforming the linearly polarized imaging illumination to circularly polarized imaging illumination;

a second quarter-wave retarder having a fast axis for transforming the circularly polarized imaging illumination to linearly polarized illumination having the same polarization orientation as the source imaging illumination, said second quarter-wave retarder having its fast axis oriented 90 degrees relative to the fast axis of said first quarter-wave retarder; and

a linear polarizer responsive to the linearly polarized imaging illumination provided by said second quarter-wave retarder for providing an image viewable by an observer of the display;

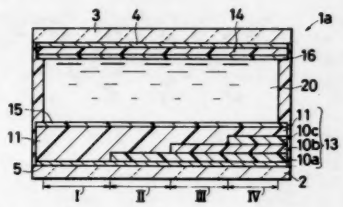
whereby said second quarter-wave retarder and said linear polarizer function to substantially block reflection that results from ambient light that passes through said second quarter-wave retarder and is reflected back through the second quarter-wave retarder toward said linear polarizer.

5,066,109

HALF-TONE LIQUID CRYSTAL DISPLAY DEVICE

Tomoaki Kuratate; Mitsuhiro Koden, and Hiroshi Hamada, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 1, 1989, Ser. No. 401,921
Claims priority, application Japan, Sep. 2, 1988, 63-220860
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—54 24 Claims



1. A display device having plural arrays of unit display regions each comprising:

at least a pair of electric insulating substrates having conductive films for defining the unit display regions, between which is placed a display layer possessing a threshold voltage for changing over an active state/inactive state, formed on mutually confronting surfaces thereof, said display layer of uniform thickness within each of the unit display regions; and

electric insulating films formed on the mutually confronting surfaces of said electric insulating substrates on which said conductive films are formed,

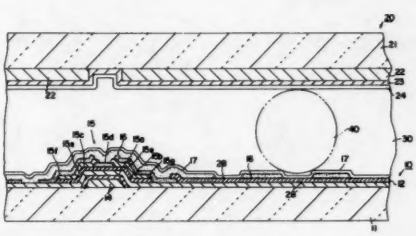
the ratio of impedance of said electric insulating film of at least one of said electric insulating substrates to impedance of said display layer is plural and of mutually different values within each unit display region.

5,066,110

LIQUID CRYSTAL DISPLAY APPARATUS

Shigeaki Mizushima, Ikoma; Eiichiro Nishimura, Nara; Seiji Fukami, Tenri; Ryuji Hashimoto, Tenri; Hisato Nagatomi, Tenri; Michihisa Onishi, Nara; Mitunobo Miyamoto, and Shoji Mitamura, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1989, Ser. No. 454,781
Claims priority, application Japan, Dec. 26, 1988, 63-328150; Feb. 20, 1989, 1-41190; Oct. 23, 1989, 1-276332
Int. Cl.[5] G02F 4/43
U.S. Cl. 359—54 8 Claims



1. A liquid crystal display apparatus comprising a pair of insulating substrates, a large number of picture element elec-

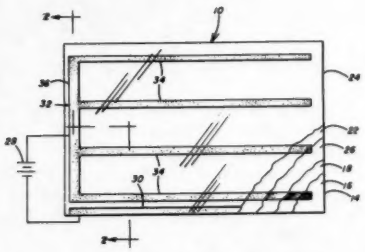
trodes disposed into a matrix on the inner surface of one of said substrates, a function element electrically connected to each of said picture element electrodes, and a liquid crystal layer charged between said pair of substrates, wherein said display apparatus further comprises on one said substrate, an insulating protective film made of an inorganic nitride, said insulating protective film being formed on said picture element electrode except for areas that constitute window regions, and an orientation film of a polyimide resin formed on the entire surface of said insulating protective film and window region, wherein said orientation film has been rubbing-processed in a first direction.

5,066,111

ELECTROCHROMIC WINDOW WITH INTEGRATED BUS BARS

David E. Singleton, Natrona Heights; Kuo-Chuan Ho, Pittsburgh, and Charles B. Greenberg, Murrysville, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1989, Ser. No. 406,477
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—275 **19 Claims**



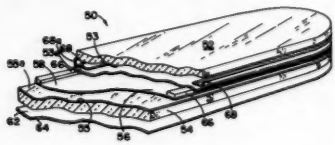
1. In a laminated article having variable transmittance in response to electric potential wherein the article includes:
electrode means comprising an electroconductive film on a surface of a transparent substrate and an electrochromic film in contact with the electroconductive film;
counter electrode means comprising an ion-conductive layer in contact with current conducting means; and
the ion-conductive layer of the counter electrode means in contact with the electrochromic film of the electrode means,
the improvement comprising:
the electrode means comprising:
at least one current conducting member in electrical contact with surface portions of the electroconductive film; and
means providing electrical connection to said at least one current conducting member.

5,066,112

PERIMETER COATED, ELECTRO-OPTIC MIRROR

Niall R. Lynam, and Richard J. Gahan, both of Holland, Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Dec. 21, 1989, Ser. No. 454,398
Int. Cl.[5] G02F *1/01*
U.S. Cl. 359—267 **54 Claims**



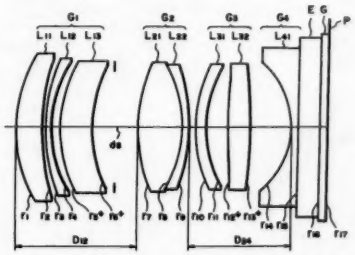
1. An electro-optic mirror assembly comprising:
at least first and second spaced, optically transparent elements, said elements each having a peripheral edge and front and rear facing surfaces and defining a space therebetween;
an electro-optic medium confined in said space the transmittance of said medium being variable upon the application of an electric field thereto;
seal means extending around the entire periphery of said assembly and extending between said first and second elements adjacent said peripheral edges for spacing said elements apart and confining said electro-optic medium in said space;
electrical means for applying an electric field to said electro-optic medium to cause variation in the light transmittance of said medium;
a reflective coating on one of said front and rear facing surfaces of said second element adapted to reflect light incident thereon through said first element and said electro-optic medium; and
a perimeter coating on at least one of a portion of said electrical means and one of said front and rear facing surfaces of said first element adjacent said peripheral edge of said first element for concealing said seal means and portions of said electrical means therebehind when said assembly is viewed from said first element toward said second element.

5,066,113

PROJECTING LENS

Masaya Nakajima, Tokyo, and Atsushi Sekine, Kasukabe, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Aug. 16, 1990, Ser. No. 568,045
Claims priority, application Japan, Aug. 18, 1989, 1-212674; Sep. 19, 1989, 1-242506
Int. Cl.[5] G02B *3/00*
U.S. Cl. 359—649 **32 Claims**



1. A projecting lens comprising, when viewed from a screen:
a first lens group having positive refracting power and an aspherical lens thereof;
a second lens group having positive refracting power
a third lens group having positive refracting power and an aspherical lens thereof; and
a fourth lens group having negative refracting power, wherein the following conditions are met assuming that a focal distance of said first lens group is f_{G1}, a focal distance of said third lens group f_{G3} and a focal distance of the overall system is f:

$$0<f/f_{G1}<0.25$$

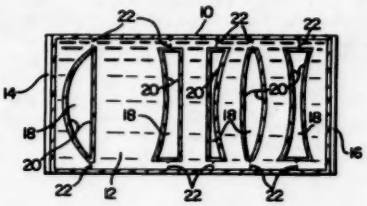
$$0<f/f_{G3}<0.3.$$

5,066,114

HIGH REFRACTION INDEX ENVELOPING MEDIUM LENS SYSTEM

Marvin P. Hodges, 1565 Shadowglen Ct., Westlake Village, Calif. 91361

Filed Apr. 26, 1990, Ser. No. 514,606
Int. Cl.[5] G02B *1/06, 3/12*
U.S. Cl. 359—665 22 Claims



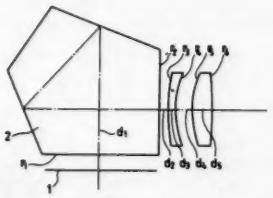
1. A lens system comprising a hollow shell; an enveloping medium having an index of refraction greater than one, said hollow shell having a window disposed at one end thereof; at least one refracting element having an index of refraction lower than that of the enveloping medium contained in said hollow shell; and a transparent chamber having substantially the same index of refraction as said enveloping medium.

5,066,115

VIEW-FINDING OPTICAL SYSTEM CAPABLE OF EYESIGHT ADJUSTMENT

Saburo Sugawara, Kawasaki, Japan, assignor to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Oct. 25, 1989, Ser. No. 426,376
Claims priority, application Japan, Oct. 26, 1988, 63-270383
Int. Cl.[5] G02B *15/14;* G03B *13/02, 13/10*
U.S. Cl. 359—676 20 Claims



1. A view-finding optical system capable of eyesight adjustment comprising, in order to form a focusing screen side:

a pentaprism;

a negative meniscus first lens having a convex surface on the focusing screen side; and

a biconvex second lens;

wherein eyesight may be adjusted by moving the second lens along an optical axis while the first lens is in a fixed position; and

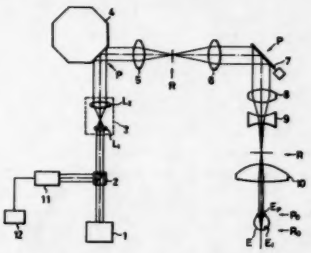
wherein a ratio of a radius of curvature of a surface of the second lens furthest from said focusing screen side to a radius of curvature of a surface of the first lens closest to the focusing side screen is greater than −2 and less than −0.8.

5,066,116

OPTICAL SYSTEM IN A LASER SCANNING EYE FUNDUS CAMERA

Akihiko Sekine, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan

Continuation-in-part of Ser. No. 212,388, Jun. 27, 1988, Pat. No. 4,960,327. This application Jul. 6, 1990, Ser. No. 549,178
Claims priority, application Japan, Jul. 15, 1987, 62-176760; May 9, 1988, 63-112070
Int. Cl.[5] A61B *3/10*
U.S. Cl. 351—221 26 Claims



1. A laser scanning eye fundus camera, comprising:

an illuminating optical means for illuminating an eye fundus through an eye pupil by scanning the eye fundus with an illuminating laser light from a laser light source, said illuminating optical means including an optical scanning device;

a light receiving optical means for directing light reflected from the eye fundus to a light receiving unit, said light receiving optical system including a display device for displaying an image of the eye fundus in response to a signal from said light receiving unit;

a magnification adjusting means for changing the magnification of the image of the eye fundus on said display device;

beam diameter adjusting means disposed in said illuminating optical system at a position conjugate with the intended position of the pupil for adjusting the beam diameter of the laser beam projected onto said eye fundus; and

means for interlocking said beam diameter adjusting means with said magnification adjusting means wherein an adjustment of said magnification adjusting means to increase the magnification causes said beam diameter adjusting means to be adjusted to reduce the beam diameter.

5,066,117

PERIMETER

Isao Matsumura, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 333,884, Apr. 4, 1989, abandoned, which is a continuation of Ser. No. 191,734, May 2, 1988, abandoned, which is a continuation of Ser. No. 831,703, Feb. 21, 1986, abandoned. This application Jul. 10, 1990, Ser. No. 550,201
Claims priority, application Japan, Feb. 26, 1985, 60-36781; Feb. 26, 1985, 60-36782; Mar. 12, 1985, 60-48629; Mar. 12, 1985, 60-48630; Mar. 12, 1985, 60-48631
Int. Cl.[5] A61B *3/02*
U.S. Cl. 351—226 31 Claims

1. A perimeter, comprising in the following order in an optical path:

a semi-transparent member adapted to be disposed in a fixed position in front of an eye to be examined which transmits index light to the eye;

an index imaging system behind said semi-transparent member in the optical path, said index imaging system having a predetermined index adapted to be projected onto a fundus of the eye to be examined by said index imaging system; and

a light-shielding cover for shielding external light, wherein said index imaging system is in one body rotatable about the iris of the eye to be examined within a range of said semi-transparent member to displace a position of an index

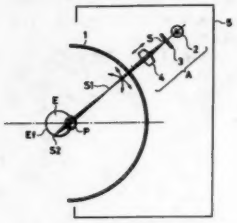


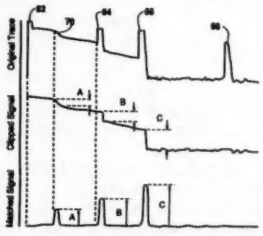
image on the fundus of the eye through said semi-transparent member, and said index imaging system comprises image forming means for moving an intermediate image of said index in the direction of the optical axis toward a position corresponding to a refractive power of the eye.

5,066,118

OPTICAL FAULT FINDER USING MATCHED AND CLIPPING FILTERS

Richard Buerli, Thousand Oaks, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1990, Ser. No. 508,834
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—73.1 **19 Claims**



1. A device for detectign faults in an optical fiber, comprising:

means for receiving an optical signal emanating from a near end of the optical fiber, said optical signal including at least one discrete loss;

means for optically coupling said receiving means to the near end of the optical fiber; and

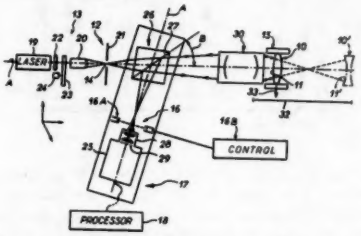
processing means electrically connected to said receiving means, said processing means including matched filter means for detectign said discrete loss in said optical signal, said matched filter means sequentially operating on a set of data points derived from said optical signal, said datapoints including: a reference point, at least two datapoints succeeding said reference point.

5,066,119

OPTICAL DEVICE FOR PHASE DETECTION TESTING OPTICAL SYSTEMS, ESPECIALLY OPHTHALMIC LENSES

Patrick Bertrand, Issy les Moulineaux, France, assignor to Essilor International, Cie Generale d'Optique, Creteil Cedex, France

Filed May 23, 1990, Ser. No. 527,435
Claims priority, application France, Jun. 5, 1989, 89 07385
Int. Cl.[5] G01B *9/00*
U.S. Cl. 356—124 **13 Claims**



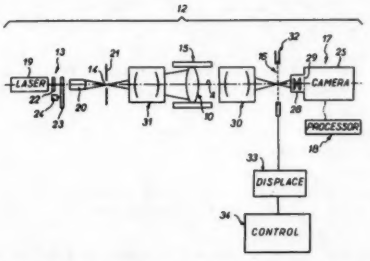
1. Optical device for phase detection testing of an optical system comprising, on an optical path having an optical axis, emission means defining a light source, a holding station for receiving an optical system under test, a diffraction array, image receiving means for receiving an image observable optically downstream of said diffraction array, data processing means connected to the receiving means for exploiting the image by phase detection, a separator element defining a semi-reflecting surface on the axis of the optical path between said emission means and said holding station, said diffraction array and said receiving means being disposed laterally of said separator means relative to the optical path and in optical alignment with said separator element, said data processing means having a ray plotting program and calibration means compensating for theoretical and manufacturing abberations due to said separator element.

5,066,120

OPTICAL DEVICE FOR PHASE DETECTION TESTING OPTICAL SYSTEM, ESPECIALLY OPHTHALMIC LENSES

Patrick Bertrand, Issy les Moulineaux, France, assignor to Essilor International, Cie Generale d'Optique, Creteil Cedex, France

Filed May 23, 1990, Ser. No. 527,344
Claims priority, application France, Jun. 5, 1989, 89 07386
Int. Cl.[5] G01B *9/00*
U.S. Cl. 356—124 **8 Claims**



1. Optical device for phase detection testing of an optical system comprising, on an optical path, emission means defining a light source, a holding station for receiving an optical system under test, a diffraction array, image receiving means for re-

ceiving an image observable optically downstream of said diffraction array, data processing means connected to the receiving means for exploiting the image by phase detection, a convergence adapter element disposed between said holding station and said diffraction array, said data processing means having a ray plotting program and calibration means for compensating for theoretical and manufacturing abberations due to said convergence adapter element.

5,066,121

METHOD AND APPARATUS FOR MEASURING THE FLASH DURATION OF A FLASH UNIT

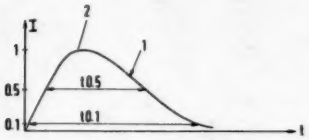
Jean-Francois Bernhard, Morrens, assignor to Bron Elektronik AG, Allschwil, Switzerland

Filed Sep. 29, 1989, Ser. No. 415,075

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833208

Int. Cl.[5] G01J *1/42;* H01J *40/14*

U.S. Cl. 356—218 12 Claims



1. An apparatus for measuring a flash duration of a flash unit, comprising:

at least one sensing element for measuring a light intensity of a flash;

a time-lay element;

a peak detector for detecting a maximum of an electrical signal resulting from converting said light intensity of said flash, with said time-lag element and said peak detector being connected in parallel with said at least one sensing element and each having an output;

a comparator that is connected to said outputs of said time-lag element and said peak detector and itself has an output; and

a time-interval measuring circuit that is connected to said output of said comparator.

5,066,122

HOOKING CAP FOR BORESCOPE

Allan I. Krauter, Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Nov. 5, 1990, Ser. No. 609,464

Int. Cl.[5] G02B *23/16, 23/24*

U.S. Cl. 356—241 17 Claims

10. A hooking cap which removably attaches to a generally cylindrical distal tip of an elongated flexible borescope, the hooking cap comprising a generally cylindrical sleeve that circumferentially overfits said borescope distal tip; and at least one wing disposed at a distal end of said sleeve and projecting generally radially to a wing tip that lies radially outward of the tip of borescope a distance sufficient to permit hooking onto a projection, each said wing including a tab formed thereon on a side away from the wing tip, the tab having an axial edge and a circumferential edge to engage axial and proximal circumferential shoulders on the borescope distal tip.

5,066,123

DEVICE FOR ELECTROTHERMAL ATOMIZING OF SAMPLES FOR SPECTROSCOPIC PURPOSES

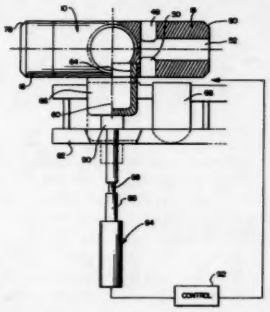
Rolf Tamm, Salem; Gunther Rodel, Owingen, and Erich Stengele, Taisersdorf, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 481,834

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907454

Int. Cl.[5] G01N *21/74*

U.S. Cl. 356—312 4 Claims



1. In a device for electrothermal atomization of samples for spectroscopic purposes, comprising:

a furnace body made of an electrically conductive, spectroscopically inert material,

means for passing electrical current through the furnace body,

a sample receptacle comprising a pot which is separated from the furnace body and projects into a lateral aperture of the furnace body,

a rod made of thermally insulating material and comprising at least one contraction,

a driving device connected to said sample receptacle via said rod for moving said pot into and out of thermal contact with the furnace body,

a controlling device for controlling the driving device and the electrical heating current through the furnace body, for causing said sample receptacle to engage said furnace body during a drying and decomposing step and thereafter to be removed from the furnace body by said driving device, and with said sample receptacle removed, for causing said furnace body to be heated to an atomization temperature, and then moved into contact with said sample receptacle.

5,066,124

ATOMIC ABSORPTION SPECTROPHOTOMETER FOR SIMULTANEOUS MULTI-ELEMENT ANALYSIS

Jurgen Wulf, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 23, 1990, Ser. No. 513,395

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 3924060

Int. Cl.[5] G01N *21/71, 21/74;* G01J *3/36*

U.S. Cl. 356—312 4 Claims

1. Atomic absorption spectrophotometer for simultaneous

measurement of atomic absorption of a plurality of elements, comprising:

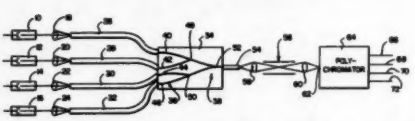
a plurality of line-emitting light sources for simultaneously emitting resonant lines of respective ones of a plurality of looked-for elements;

optical coupler means for superimposing upon each other the resonant lines simultaneously originating from said plurality of line-emitting light sources in order to form a single light beam containing the superimposed resonant lines from the plurality of line-emitting light sources;

an atomizing device for atomizing a sample under investigation and for generating an atomic vapor in which the looked-for elements of the sample are present in their atomic state;

optical means for passing the single light beam through the atomic vapor;

detector means for receiving said single light beam after passage through said atomic vapor, for separately detecting the absorptions to which the resonant lines of the different looked-for elements in the sample are subjected;



light guide means which only insignificantly absorb light in the spectral range of the resonant lines emitted by the plurality of line-emitting light sources;

said light guide means being disposed intermediate said plurality of line-emitting light sources and said optical coupler means, for guiding the emitted resonant lines from the line-emitting light sources to said optical coupler means;

said optical coupler means constituting an integrated optical system containing a plurality of entrance-side light guides for receiving the emitted resonant lines from said light guide means, and a common exit-side light guide which is coupled to said entrance-side light guides; and

an exit light guide coupled to said common exit-side light guide of said optical coupler means for directing said single light beam from said optical coupler means to said atomizing device.

5,066,125

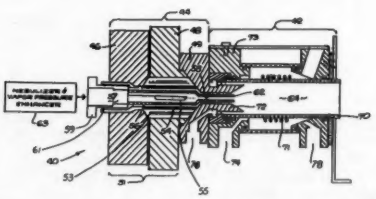
ELECTROTHERMAL DIRECT INJECTION TORCH FOR INDUCTIVELY COUPLED PLASMA

Michael D. G. Rogers, and William B. Henderson, both of Torrance, Calif., assignors to Geochemical Services, Inc., Rocklin, Calif.

Continuation of Ser. No. 191,723, May 6, 1988, abandoned, which is a continuation of Ser. No. 23,069, Mar. 6, 1987, abandoned. This application Nov. 15, 1989, Ser. No. 436,970

Int. Cl.[5] G01N *21/73, 21/74*

U.S. Cl. 356—316 **15 Claims**



1. A spectroscopy apparatus for atomizing and analyzing the spectra of test samples, comprising:

electro-thermal atomization means for atomizing test samples, the atomization means having an outlet through which the atomized test samples may exit, and heating means for heating both the test sample and the outlet; and

an inductively coupled plasma torch for ionizing and exciting the atomized test samples, said torch having a containment wall within which the atomized test samples are ionized and excited, the outlet of the atomizer means being located adjacent to or within the boundaries of the containment wall.

5,066,126

OPTICAL SPECTRUM ANALYZER

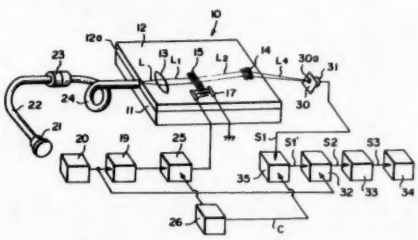
Masami Hatori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 18, 1989, Ser. No. 385,746

Claims priority, application Japan, Jul. 19, 1988, 63-179648

Int. Cl.[5] G01J *3/28, 3/06;* **G02B** *6/10*

U.S. Cl. 356—328 **4 Claims**



1. An optical spectrum analyzer comprising:

i) an optical waveguide made of a material capable of propagating a surface elastic wave therethrough;

ii) surface elastic wave generating means for generating in said optical waveguide a surface elastic wave which has a continuously varying frequency and which diffracts and deflects a guided wave as it travels across the path of a guided wave, which guided wave is introduced as a measured light beam into and travels in said optical wave guide;

iii) light detecting means for detecting said measured light beam which has been deflected by said surface elastic wave and emitted from said optical waveguide;

iv) modulating means for turning on and off said surface elastic wave by repeatedly energizing and de-energizing said surface elastic wave generating means, the frequency of the modulation being lower than the continuously varying frequency;

v) filter means for receiving a signal corresponding to said modulation frequency from said modulating means and a signal corresponding to said measured light beam from said light detecting means, and for extracting a signal component having the same frequency as said modulation frequency from said signal received from said light detecting means; and

vi) frequency detecting means which is responsive to said signal component extracted by said filter means and detects the frequency of said surface elastic wave when said measured light beam is detected by said light detecting means.

5,066,127

STIGMATIC IMAGING WITH SPHERICAL CONCAVE DIFFRACTION GRATINGS

John P. Schwenker, Boulder, Colo., assignor to Hyperfine, Inc., Boulder, Colo.

Filed Aug. 29, 1989, Ser. No. 399,854

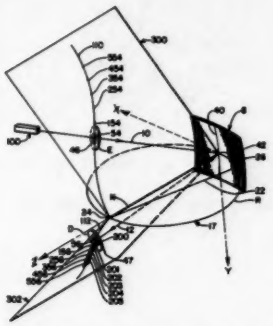
Int. Cl.[5] G01J *3/20*

U.S. Cl. 356—328 **4 Claims**

1. Optical spectroscopy apparatus for analyzing the characteristics of a light beam, comprising:

a concave spherical diffraction grating having a radius of curvature and plurality of parallel diffraction rulings inscribed thereon, wherein one of said rulings is a center ruling that passes through the center of the grating and an optical axis projects outwardly from the center of the grating through the center of curvature of the grating;

beam entrance means for projecting an entrance beam of light through an entrance point; and



beam detection means for detecting a beam of light that passes through said entrance point and is diffracted by said grating to pass through a detection point, wherein said entrance point and said detection point are located at about respective positions defined in relation to the grating and to each other by the equations:

$$Z = R\frac{(1+\cos 2\theta)}{2}$$

$$X = \pm Y = Z\sqrt{\frac{\left(\frac{R}{Z}-1\right)}{\left(2-\frac{R}{Z}\right)}}$$

$$\theta = \sin^{-1}\frac{m\lambda}{2d}$$

where:

R=radius of curvature of the grating;

d=spacing of the rulings;

m=order number of the diffracted beam being detected;

λ=wavelength of the diffracted beam being detected; and

Θ=the in-plane diffraction angle for the particular grating and wavelength; and

further, where the X, Y, and Z values are spatial positions in an X, Y, Z coordinate system wherein the origin of the coordinate system is coincident with the optical center of the grating where the light is incident, the Z coordinate axis is collinear with the optical axis, the X coordinate axis is orthogonal to both the Z axis and the central ruling, and the Y coordinate axis is orthogonal to both the Z and X coordinate axes.

5,066,128

DIGITAL PULSE COUNTING METHOD FOR MEASURING THE OPTICAL PATH DIFFERENCE OF AN IMBALANCED INTERFEROMETER

Zhuo-Jun Lu, Pierrefonds, Canada, assignor to Canadian Marconi Co., Montreal, Canada

Filed Mar. 27, 1990, Ser. No. 499,798

Claims priority, application Canada, Sep. 5, 1989, 610320

Int. Cl.[5] G01B 9/02

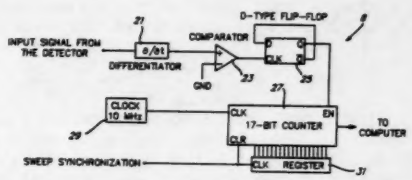
U.S. Cl. 356—349 **3 Claims**

1. A method for measuring the optical path difference of an imbalanced interferometer fed by a laser whose wavelength is modulated, said method comprising the steps of:

applying the output of said laser to said imbalanced interferometer;

measuring light intensity at the output of said imbalanced interferometer, said light intensity comprising a periodic signal having a frequency;

converting the light intensity signal to an electrical signal having the same frequency;



converting the electrical signals to a series of pulses having the sam frequency as the electrical signals;

providing a series of clock pulses having a frequency greater than the frequency of the series of pulses;

counting the clock pulses between two adjacent measured pulses, the count comprising a parameter P;

defining a frequency measurement parameter $\tau = MxP$ where M is a given predetermined number;

determining Δ from the equation:

$$\frac{d\Delta}{\Delta_o} = -\frac{d\tau}{\tau_o}$$

where Δ_o=the initial optical path difference of the interferometer

τ_o=frequency measurement parameter at Δ

Δ=said optical path difference.

5,066,129

OPTICAL LINEAR ENCODER WITH LIGHT QUANTITY CALABRATION

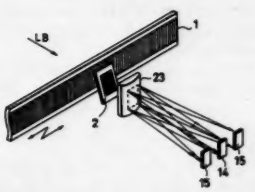
Keiji Matsui, Miwa, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Aug. 28, 1990, Ser. No. 574,290

Claims priority, application Japan, Aug. 30, 1989, 1-224016

Int. Cl.[5] G01B 9/02

U.S. Cl. 356—356 **3 Claims**



1. An averaged diffraction moire position detector which is capable of detecting the relative displacement of a diffraction grating in the lateral direction by using a signal change such that half the pitch P of a diffraction grating which appears at an average value is used as a cycle, comprising:

a first diffraction grating;

a second diffraction grating which is displaced in the lateral direction with respect to the first diffraction grating;

optical-path length adjustment means, disposed between said two diffraction gratings, for varying the optical-path length of the gap between said two diffraction gratings over the range of an optical-path length equivalent to a

Fresnel number 2 or an integral multiple of 2 for each part of an effective area of said two diffraction gratings; and

average value obtaining means for obtaining a signal equivalent to the average value of the diffraction moire signals over the effective areas of said two diffraction gratings,

wherein said averaged diffraction moire position detector includes a calibration means for calibrating a relative displacement signal of said diffraction grating in the lateral direction obtained by detecting even-number-order diffracted lights among respective order diffracted lights diffracted by said first and second diffraction gratings, by a calibration signal obtained by detecting odd-number-order diffracted lights among said respective order diffracted lights.

5,066,130

DISPLACEMENT MEASURING APPARATUS

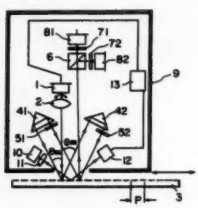
Masaaki Tsukiji, Tokyo; Tetsuharu Nishimura, Kawasaki; Koh Ishizuka, Urawa; Satoshi Ishii, Tokyo, and Yoichi Kubota, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1989, Ser. No. 347,397

Claims priority, application Japan, May 10, 1988, 63-113083; Jul. 18, 1988, 63-180022

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—356 **31 Claims**



1. A displacement measuring apparatus comprising:

a scale relatively displaced to an irradiating beam;

a reading head to read said scale by the irradiating beam; and

control means to control the apparatus for avoiding substantially the leakage of the irradiating beam out of the apparatus in response to the positional error of the scale and the irradiating beam,

wherein said control means comprises modulating means to modulate the intensity of said irradiating beam.

5,066,131

STAGE MECHANISM

Mikio Iwata, Ibaraki; Takao Kariya, Tokyo, and Masaru Ohtsuka, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1989, Ser. No. 388,484

Claims priority, application Japan, Aug. 17, 1988, 63-203110

Int. Cl.[5] G01B *11/00*

U.S. Cl. 356—401 **20 Claims**

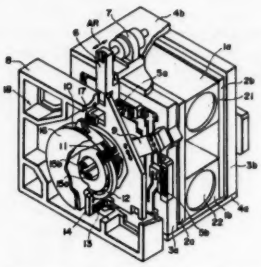
1. A stage device, comprising:

two plate members disposed with a predetermined distance in a Z direction maintained therebetween, each of said plate members comprising a fixed portion, a leaf spring portion, and a first stage portion which are defined by a plurality of grooves, wherein in each plate member, said first stage portion is supported by said fixed portion through said lead spring portion for movement in each of X, Y, and θ directions, relative to said fixed portion;

first driving means for displacing said stage portions in each of the X, Y, and θ directions relative to said fixed portions, wherein each of said plate members is provided with a corresponding first driving means;

coupling means for coupling said stage portions of said plate members to each other;

a second stage portion supported by one of said stage portions through a resilient member, for movement in the Z direction relative to said plate members;



second driving means for displacing said second stage portion in the Z direction relative to said plate members; and

a holding chuck mounted to said second stage portion.

5,066,132

METHOD OF AND APPARATUS FOR INSPECTING PAINT COATING

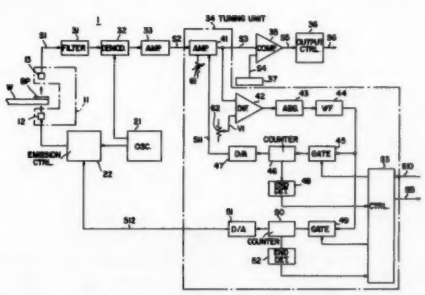
Tsuyoshi Nagata, Ibaragi, and Shinji Okuda, Takarazuka, both of Japan, assignors to Sunstar Engineering, Inc., Osaka, Japan

Filed Aug. 8, 1990, Ser. No. 564,167

Claims priority, application Japan, Aug. 9, 1989, 1-207396; Aug. 9, 1989, 1-207397

Int. Cl.[5] G01N *21/59, 21/88*

U.S. Cl. 356—432 **4 Claims**



2. An inspecting apparatus for inspecting a film-like coating formed on a workpiece, which comprises:

a light emitter and a light receiver adapted to be positioned on respective sides of the workpiece, said light receiver generating a detection signal indicative of the amount of light having passed through the workpiece;

an amplifying means for amplifying the detection signal from the light receiver and for generating an amplified output signal;

a comparing means for comparing the amplified output signal from the amplifying means with a predetermined level and for generating a control signal indicative of a difference between the amplified output signal and the predetermined level;

a zero adjusting means for adjusting the amplified output signal from the amplifier to a zero value; and

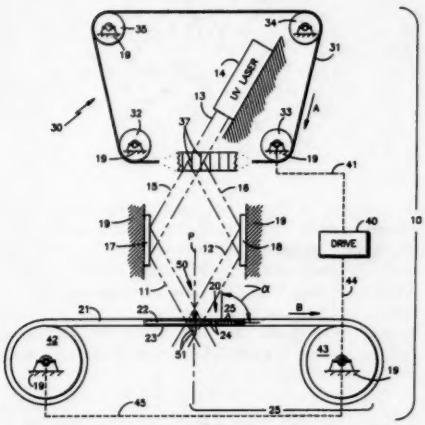
a tuning means for tuning the amplified output signal from the amplifier to a predetermined tuned value.

5,066,133

EXTENDED LENGTH EMBEDDED BRAGG GRATING MANUFACTURING METHOD AND ARRANGEMENT

Michael J. Brienza, Easton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 18, 1990, Ser. No. 600,645
Int. Cl.[5] G02B 5/18
U.S. Cl. 359—570 10 Claims



1. An arrangement for forming an extended length light redirecting embedded grating in an elongated solid material optical waveguide having a longitudinal axis, comprising:

a support;

means for supporting the optical waveguide on said support with the longitudinal axis extending in a predetermined direction such that a portion thereof is situated at a predetermined location;

means mounted on said support for directing a coherent light beam of a frequency in the ultraviolet range in a predetermined primary path transversely toward the waveguide;

a diffraction grating supported on said support such that a section thereof extends through a zone of said primary path that is disposed at a predetermined spacing from the waveguide, said diffraction grating having a dimension normal to said primary path that exceeds the corresponding dimension of said primary path;

means for effectuating relative movement along said direction between, said portion and said section in unison, relative to said primary path, with attendant diffraction of said light beam at said diffraction grating into two mutually frequency shifted partial light beams propagating in diverging secondary paths beyond said diffraction grating and toward the waveguide with at least one of said secondary paths being aimed at a region remote from said location; and

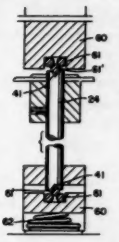
means, mounted on said support such as to be stationary relative to said directing means and interposed between said diffractive grating and the waveguide, for causing at least the other of said partial light beams to travel toward said location with attendant formation of an interference pattern having respective high intensity fringes which extend through the waveguide at respective positions that are stationary relative to the waveguide to effect refractive index changes at such positions along a length of the waveguide that exceeds that of said portion.

5,066,134

FLUID AGITATOR

Yataro Nagai; Sanjiro Nagai; Mitsuyoshi Matsushita; Hiroshi Ohbori; Yuji Yamauchi, all of Tokyo, Japan, assignors to Tanken Seiko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 423,648, Oct. 17, 1989, Pat. No. 4,982,373, which is a continuation of Ser. No. 45,056, Mar. 6, 1987, abandoned. This application Aug. 9, 1990, Ser. No. 589,459
Claims priority, application Japan, Aug. 8, 1985, 60-181646; Dec. 26, 1985, 60-292292
Int. Cl.[5] B01F 13/02, 7/18
U.S. Cl. 366—102 6 Claims



1. A fluid agitator installed in a closed space holding fluid to be stirred, comprising:

an agitation chamber provided in said closed space, said agitation chamber comprising a fluid to be stirred inlet and a separate outlet for the stirred fluid;

a turbine chamber provided in said closed space;

sealing means substantially sealing said turbine chamber from said agitation chamber;

a turbine blade set in said turbine chamber;

means for introducing driving fluid into said turbine chamber from outside of said closed space, for driving and rotating said turbine blade;

means for transmitting the rotation of said turbine blade to the outside of said turbine chamber; and

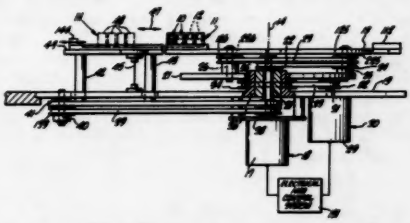
an agitating blade connected to said transmitting means outside of said turbine chamber.

5,066,135

ROTATABLE VORTEXING TURNTABLE

Richard C. Meyer, La Habra, and Duane G. Barber, Yorba Linda, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 9, 1988, Ser. No. 230,208
Int. Cl.[5] B01F 11/00; B06B 1/10; G01N 21/13
U.S. Cl. 366—208 39 Claims



1. A rotatable turntable comprising a vortexing plate on which reactants are to be located for vortexing action, a first motive drive including a shaft rotatable about a central axis for moving the plate with the vortexing action, a second motive drive including a drive shaft rotatable about an axis for causing the plate to rotate, both the first motive drive and the second motive drive include motive housings, and both the axes of rotation of the drive shafts and the motive housings being mounted to be non-rotational during operation of the first and

the second motive drives, wherein the vortexing plate is circular, the turntable including a rotatable drive plate having a central axis of rotation cooperatively mounted below the vortexing plate, a base plate cooperatively mounted below the drive plate, and a mounting on the base plate for locating the drive plate relative to the base plate, the base plate being stationary, the drive plate being subject to rotation about the axis of rotation and being free of vortexing action, and the vortexing plate being subject to vortexing and rotational movement, wherein the vortexing plate includes radially located reactant stations about the plate, the reactants for vortexing being located at selected reactant stations, and wherein both the first and second motive housings are mounted below the drive plate.

5,066,136

VIBRATORY MIXERS

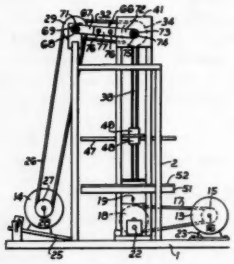
Alan S. Johnson, Maidenhead, Great Britain, assignor to Red Devil, Inc., Union, N.J.

Continuation of Ser. No. 162,548, Mar. 1, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 608,023

Claims priority, application United Kingdom, Jul. 1, 1986, 8616034; Jun. 25, 1987, PCT/GB87/00446

Int. Cl.[5] B01F *11/00, 3/12*

U.S. Cl. 366—209 **33 Claims**



1. A vibratory mixer for mixing ingredients by shaking comprising: a load platform (**51**) for receiving a container (**88**) which holds the ingredients to be mixed, clamping means (**28, 42, 47**) cooperable with the load platform to clamp a container therebetween, means (**14, 26** to **48**) for effecting relative movement between the load platform and the clamping means so as to clamp and unclamp a container, said means comprising at least one lead screw (**38, 42**) and a first motor (**14**) operable to drive said at least one lead screw, means for permitting axial movement of said at least one lead screw in response to clamping and unclamping of said clamping means (**42**), a second motor (**13**) operable to shake the load platform (**51**), control means operable to control a sequence of operation of the apparatus, said control means including switch means (**65**) connected in circuit with the first motor (**14**), said switch means being actuatable by said axial movement of said at least one lead screw (**42**) which takes place due to the reaction of a container (**88**) being clamped between the load platform (**51**) and the clamping means (**47**), whereby the first motor (**14**) is deenergized at a predetermined axial displacement of said at least one lead screw.

5,066,137

STEAM INJECTION AND MIXING APPARATUS

Leonard T. King, 4109 Cedar Ave., Long Beach, Calif. 90807

Filed Mar. 4, 1991, Ser. No. 664,029

Int. Cl.[5] B01F *5/06*

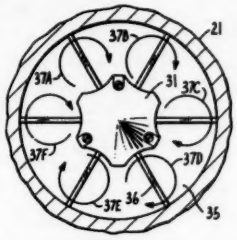
U.S. Cl. 366—336 **8 Claims**

1. A device for the injection and mixing of steam into a fluid stream comprising:

a. a substantially cylindrically-shaped conduit having a longitudinal axis and substantially circular cross-section for carrying said fluid stream, said conduit also being provided with an inlet for accepting said fluid stream and an outlet for discharging said fluid stream along said longitudinal axis;

b. means for discharging steam substantially proximate said longitudinal axis within said cylindrically shaped conduit;

c. material mixing apparatus for mixing said steam with said fluid stream which is in the shape of said conduit which comprises a plurality of openings housing mixing elements which each induce a rotational angular velocity of the



same sign to the fluid stream passing therethrough, said material mixing apparatus further characterized as possessing plug means for substantially blocking said steam discharge means when said plug means is in a first position but not blocking said steam discharge means when said plug means is in a second position; and

d. means for urging said plug means to said first position and resisting movement of said plug means from assuming said second position.

5,066,138

OPTICAL HEAD APPARATUS

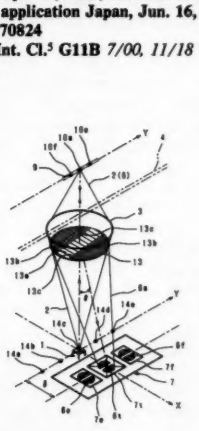
Eiichi Toide; Shinsuke Shikama, and Masayuki Kubota, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1989, Ser. No. 337,136

Claims priority, application Japan, Jun. 16, 1988, 63-177701; Jul. 11, 1988, 63-170824

Int. Cl.[5] G11B *7/00, 11/18*

U.S. Cl. 369—112 **7 Claims**



1. An optical head apparatus comprising: a light source;

a recording medium on which data is recorded in a predetermined direction;

a condensing means for condensing the light beam emitted from said light source onto the recording medium;

a beam splitter for altering the irradiating direction of the reflected light beam from said recording medium;

said beam splitter comprising one holographic element being composed of at least two grid regions having diffraction lines oriented in different directions;

a photo detector for detecting the light beams reflected from said recording medium; and

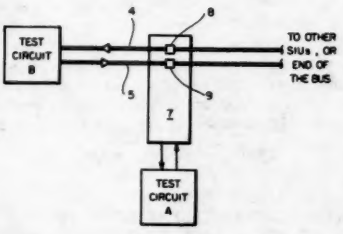
the first grid region of said holographic element splitting the light beam emitted from said light source into at least three light beams with different condensing positions on the path from said light source to said recording medium, and the second grid region of said holographic element being comprised of two sub-regions which are positioned on opposite sides of said first grid region and diffracting the light beam reflected from the recording medium and causing the light paths of said light beams to be different from the path of the light beam emitted from said light source to make the reflected light beam be bound for said photo detector.

5,066,139

COUPLER VERIFICATION TEST CIRCUIT

Paulmer M. Soderberg; Kristin K. Foss, both of Menlo Park; Thomas E. Giles, Union City, and Ralph A. Narciso, Woodside, all of Calif., assignors to Raynet Corporation, Menlo Park, Calif.

Filed Aug. 28, 1989, Ser. No. 399,686
Int. Cl.[5] H04L *1/14;* H04B *3/46*
U.S. Cl. 371—20.1 **15 Claims**



1. A method of installing a subscriber interface unit ("SIU") onto an optical fiber telecommunications network configured so as to have an office interface unit ("OIU") which is to communicate to a plurality of SIUs when the network is operating, comprising the steps of:

attaching a first test circuit to the network at a location corresponding to where an operational OIU is later to be operating so that the network can later operate and communicate with remote systems outside the network, the first test circuit being connected to optical fiber means;

attaching electrooptic elements of the SIU to the optical fiber means;

attaching a second test circuit to the SIU;

initiating the second test circuit so as to generate an optical signal to be transmitted to the first test circuit along the optical fiber means;

monitoring the second test circuit to determine if an error or acknowledgement return signal is received from the first test circuit and detected by the SIU so as to indicate whether or not the SIU is functioning properly; the attaching, initiating and monitoring steps being done prior to having the operational OIU operating so as to communicate with the remote systems.

5,066,140

TEMPERATURE MEASUREMENT

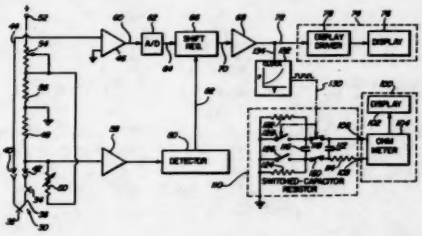
Anthony V. Beran, Santa Ana, Calif., assignor to Respiratory Support Products, Inc., Irvine, Calif.

Filed Oct. 13, 1987, Ser. No. 107,989
Int. Cl.[5] G01K *7/02, 7/22;* H03H *11/00*
U.S. Cl. 374—134 **8 Claims**

1. For connection to a temperature measuring instrument designed to receive as an input the resistance developed by a thermistor probe, said resistance varying in a nonlinear manner with the temperature at said probe, in combination:

a thermocouple circuit means for developing a potential related to the ambient temperature at said circuit means, said circuit means comprising a hot junction and a cold junction connected in a series circuit; and

signal processing means responsive to said potential for producing a resistance value which simulates the resistance developed by said thermistor probe at said ambient temperature;



said signal processing means including means for generating said resistance value, said resistance generating means comprising a capacitor and a variable rate pulse generator connected to charge the capacitor to a potential which is a function of said ambient temperature;

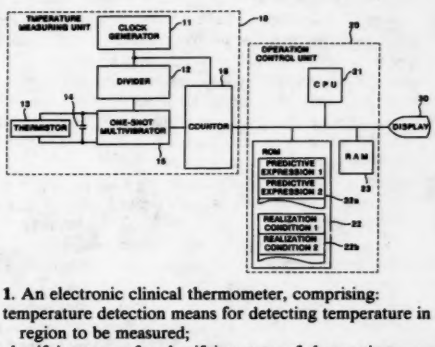
whereby said temperature measuring instrument is adapted to operate with said thermocouple circuit means.

5,066,141

ELECTRONIC CLINICAL THERMOMETER

Makoto Ikeda, and Makoto Toriumi, both of Nakai, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 593,016
Claims priority, application Japan, Oct. 5, 1989, 1-258799
Int. Cl.[5] G01K *7/00, 3/04;* G06F *15/42*
U.S. Cl. 374—169 **15 Claims**



1. An electronic clinical thermometer, comprising:

temperature detection means for detecting temperature in a region to be measured;

classifying means for classifying states of changes in temperature into a plurality of predetermined groups in dependence upon a change in temperature during a predetermined period prior to a prediction operation;

memory means for previously storing a plurality of sets corresponding to the predetermined groups of said classifying means, each set including at least one of an operational expression and a prediction realization condition of equilibrium temperature;

prediction method setting means for selecting one of the sets stored in said memory means in accordance with changes in the temperature detected over a passage of time; and

predictive operation means for predictively calculating an

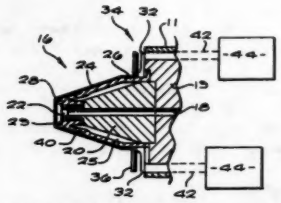
equilibrium temperature by a prediction method using the set selected by said prediction method setting means and the temperature detected by said temperature detection means.

5,066,142

PROTECTIVE APPARATUS FOR A BIOMEDICAL PROBE

Michael P. DeFrank, Temecula, and Robert J. Rosati, Carlsbad, both of Calif., assignors to IVAC Corporation, San Diego, Calif.

Filed Mar. 8, 1990, Ser. No. 490,333
Int. Cl.[5] G01K *1/08*
U.S. Cl. 374—208 22 Claims



14. A hand-held biomedical apparatus comprising:

a probe having a distal end for being directed at a patient and a base portion and comprising a waveguide formed through the probe and opening at the distal end for receiving energy from the patient and conducting the energy through the probe;

protection means for protecting the probe, the protection means comprising a protective probe cover having a frame member with an aperture sized to fit over the base portion of the probe and to be retained in a fixed position in relation to the base portion by interference fit, the probe cover having a stretchable material attached to the probe cover frame member and extending across the aperture such that when the distal end of the probe is inserted through the aperture to fit the probe cover frame member over the base portion, the material will stretch to conform generally to the shape of the probe;

the protection means further comprising waveguide protection means for providing material around the waveguide along its entire length and at its distal end opening for protecting the waveguide, the waveguide protection means comprising an outer boot mounted over and surrounding the waveguide along its length on which is formed the base portion for mounting the frame member and which forms the outer surface of the probe to which the stretchable material conforms and window means for sealing the opening of the waveguide at the distal end against contaminants while being transparent to the energy received by the waveguide and a sleeve mounted over the window means and the distal end of the waveguide for protecting the window means and waveguide from physical shocks and the outer boot is mounted over the window means, the sleeve and the waveguide along its length; and

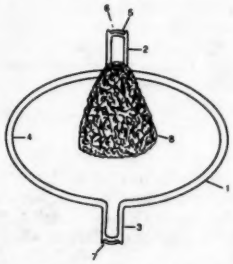
the protection means further comprises sensor means for sensing the presence of the protective probe cover at the fixed position on the probe and for providing a signal responsive to the sensing.

5,066,143

LEAF BAGGING EQUIPMENT

Stephen Sanders, 1569 Harpers Cove La., Reston, Va. 22094

Continuation-in-part of Ser. No. 388,505, Aug. 2, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 605,000
Int. Cl.[5] B65D *30/10, 33/06, 33/28*
U.S. Cl. 383—4 3 Claims



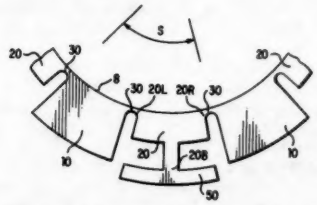
1. A single flat-lying substantially circular flexible plastic sheet with two handle shaped extensions, hereafter referred to as handles, located diametrically opposite each other along the perimeter of the said plastic sheet, said sheet completely covering the area within its entire said perimeter, said sheet being hemmed at substantially the entire said perimeter thereof to form a channel, a continuous draw string or draw tape, hereafter referred to as draw string, enclosed in said channel, openings in said channel at said handles to expose said draw string, the length of said draw string being less than the length of the said perimeter of the said sheet, said draw string used to form said sheet into a bag.

5,066,144

HYDRODYNAMIC BEARINGS HAVING A CONTINUOUS BEAM MOUNTED SUPPORT SURFACE

Russell D. Ide, P.O. Box 744, 641 Arnold Rd., Coventry, R.I. 02816

Continuation-in-part of Ser. No. 309,081, Feb. 8, 1989, which is a continuation-in-part of Ser. No. 283,529, filed as PCT US88/01841, May 27, 1988, which is a continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned. This application Apr. 30, 1990, Ser. No. 516,977
Int. Cl.[5] F16C *17/03*
U.S. Cl. 384—117 16 Claims



1. A hydrodynamic bearing adapted to support a shaft, the bearing comprising:

a continuous bearing surface;

a support structure supporting the continuous bearing surface, the support structure comprising a repeating series of support sections, each support section comprising:

(a) a fully rigid portion, the fully rigid portion being substantially rigid in all directions;

(b) a partially rigid portion, the partially rigid portions being substantially rigid in a first direction transverse to the portion of the bearing surface which it supports but flexible in a second direction which is substantially transverse to the first direction;

(c) a first connecting portion connecting the fully rigid

portions to the partially rigid portion along a line, the first connecting portion being thin along the line of connection so that the first connecting portion has substantially reduced moment carrying ability; and

(d) a second connecting portion connecting the partially rigid portion to the fully rigid portion of an adjacent support section along a line, the second connecting portion being thin along the line of connection so that the second connecting portion has substantially reduced moment carrying ability;

the support structure supporting the bearing surface such that under the action of friction and pressure the bearing surface deforms so as to form a substantially circumferentially spaced series of hydrodynamic wedges.

5,066,145

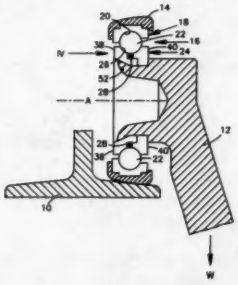
SOLID-LUBRICATED BEARING ASSEMBLY

Lewis B. Sibley, Paoli, and C. Brian Kelly, Secane, both of Pa., assignors to Tribology Systems, Inc., Paoli, Pa.

Filed Jun. 29, 1989, Ser. No. 374,167

Int. Cl.[5] F16C *33/66, 33/60*

U.S. Cl. 384—463 **30 Claims**



1. A solid-lubricated bearing assembly comprising:

a. an outer bearing member having a generally radially inwardly facing race surface formed therein adapted to receive rotatable bearing elements for rotating motion of said rotatable bearing elements respecting said outer bearing member;

b. an inner bearing member having a generally radially outwardly facing race surface formed therein adapted to receive said rotatable bearing elements for rotating motion of said rotatable bearing elements respecting said inner bearing member;

a plurality of said rotatable bearing elements retained between said race surfaces of said inner and outer bearing members;

d. solid lubricant material internally self-biased against and contacting at least one of said rotatable bearing elements for depositing a film of said solid lubricant material on said rotatable element by contact therewith as said rotatable elements rotate against said race surfaces.

5,066,146

BEARING ASSEMBLY FOR LAWN MOWER CUTTING BLADE

Orville R. McDonner, Conyers, Ga., assignor to Fuqua Industries, Inc., McDonough, Ga.

Filed Aug. 30, 1990, Ser. No. 575,485

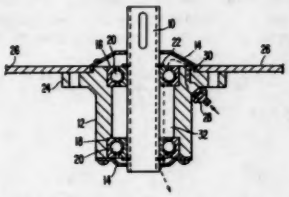
Int. Cl.[5] F16C *33/66*

U.S. Cl. 384—473 **18 Claims**

1. A bearing assembly for a lawn mower drive shaft having its axis vertically oriented, comprising

an upper and a lower bearing race means disposed in a spaced-apart relationship on said drive shaft,

a bearing assembly housing surrounding said upper and lower bearing race means and having means defining a chamber above the upper bearing race means, and



means for introducing a lubricant into said chamber above said upper bearing race means, whereby said lubricant is caused to lubricate said upper bearing race means and subsequently to migrate to said lower bearing race means.

5,066,147

MEANS FOR MOUNTING A BEARING RING

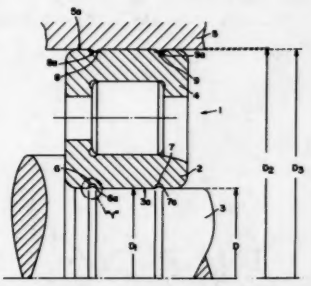
Manfred Brandenstein, Eubenheim; Armin Olschewski, Schweinfurt; Klaus Kispert, Schweinfurt; Burkhard von Bredow, Kutzberg, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed Rep. of Germany

Continuation of Ser. No. 476,840, Feb. 8, 1980, abandoned. This application Apr. 19, 1991, Ser. No. 687,849

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1989, 3931447

Int. Cl.[5] F16C *33/58*

U.S. Cl. 384—585 **1 Claim**



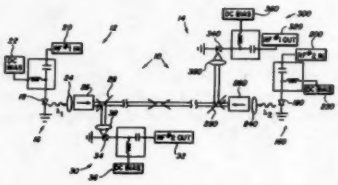
1. Means for securing a hardened roller bearing ring member having a precisely machined smooth peripheral surface by means of a press fit on the softer bearing seating surface of a machine member which is a precisely machined smooth surface in a predetermined axial position, both members made of relatively hard metals and comprising means defining at least one peripheral groove (6, 7; 8, 9), which has a sharp-edged transition to the surface of the bearing ring member (2, 4) in the peripheral surface of the rolling bearing ring (2, 4) confronting the seating surface of the machine member whereby upon relative axial displacement of the ring and machine part, material flows from the seating surface into said groove under contact pressure producing a weldment adjacent said groove as a locking rib and a firm locking connection between the members.

5,066,148

BI-DIRECTIONAL OPTICAL TRANSMISSION SYSTEM FOR RF ELECTRICAL ENERGY

Paul T. Bryant, Bowie; Joseph F. Weller, Fort Washington, both of Md., and Lew Goldberg, Fairfax, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 31, 1990, Ser. No. 560,702
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 16 Claims



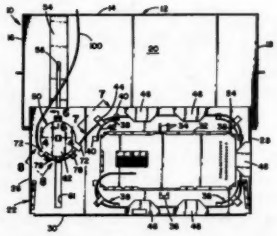
1. A bi-directional optical transmission system comprising:
first and second transmitter/receiver stations which transmit and receive light signals along an optical path therebetween, each said transmitter/receiver station including;
a laser transmitter means for transmitting a carrier light beam which is intensity modulated by a synchronization of an input radio frequency electrical signal;
a photodetector means for detecting intensity variations of the carrier light beam from the other said station and for outputting a respective radio frequency electrical signal whose synchronization is indicative thereof;
a means provided between (a) said optical path and (b) said laser transmitter means and said photodetector means, for splitting the light beams incident thereon into a passed portion and an angularly reflected portion so that said laser transmitter means and said photodetector means do not interfere with one another.

5,066,149

SPLICE TRAY WITH SLACK TAKE-UP

Todd Wheeler, Hudson, Wis., and Wayne A. Johnson, Rosemount, Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Sep. 11, 1990, Ser. No. 580,769
Int. Cl.[5] G02B *6/36*
U.S. Cl. 385—135 4 Claims



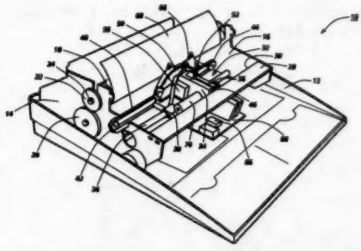
1. A splice cabinet comprising:
a chassis;
a plurality of drawers slidably mounted in the chassis and slidable between a first position with the drawer fully inserted within the chassis and the second position with the drawer extended from the interior of the chassis;
each of said drawers having disposed thereon a splice tray for splicing together optical fibers;
admitting means for admitting an optical fiber to be spliced from an exterior of a chassis into the drawer; take-up means for taking up a slack of fiber within a drawer as the drawer is moved from the first to the second position, said take-up means including a push member slidably mounted on the drawer and movable from a rear edge of a drawer toward a leading edge of the drawer.

5,066,150

LOW COST QUIET IMPACT PRINTER

Egon S. Babler, Northbrook; Johannes F. Gottwald, Park Ridge; Dennis W. Gruber, Arlington Heights; James F. Kearney; William J. Mayer, both of South Barrington, and Alf J. Olsen, Elk Grove Village, all of Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1990, Ser. No. 510,654
Int. Cl.[5] B41J *9/26*
U.S. Cl. 400—157.3 9 Claims



1. A serial impact printer comprising a support frame, a platen mounted for rotation upon said support frame, a print element having character imprinting portions disposed thereon, a print element selector for moving said print element to position a selected character imprinting portion at a printing position, a hammer for moving a selected character imprinting portion for deforming said platen with a printing force, and means for moving said hammer toward and away from said platen, the improvement comprising
said means for moving said hammer including a D.C. motor in combination with means for varying the rate of displacement of said hammer and a feedback system including a controller electrically connected to said D.C. motor, wherein the speed of said hammer is continually determined by said feedback system, said feedback system further including means for indicating the position, speed and direction of said motor,
a carriage mounted for reciprocating movement generally parallel to said platen, said carriage supporting thereon said print element, said print element selector, said hammer and said means for moving, and
a stationary reaction bar secured to said support frame and being spaced from and extending parallel to said platen, said reaction bar including a reaction surface against which said carriage is urged for developing said printing force as said hammer deforms said platen.

5,066,151

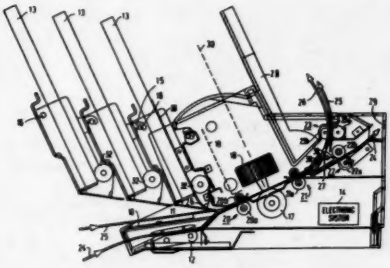
DEVICE COMPRISING A PRINTING MECHANISM

Heinrich Durr, Wilnsdorf-Niederdielfen; Manfred Rosenthal, Kirchen-Freusburg, and Manfred Adamek, Kirchen(Sieg)-Struth, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1990, Ser. No. 487,677
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906612
Int. Cl.[5] B41J *11/50*
U.S. Cl. 400—605 19 Claims

1. A device having a front and a rear region including an operator control panel defining said regions, said device including a printing mechanism including a printing head displaceable along an axis, means including drive rollers for trans-

porting paper sheets, said mechanism including means for transporting endless paper by a tractor, the combination therewith including means for forming a single feed region preceding the printing mechanism relative to said rear region, said feed region for feeding paper sheets and endless paper over a given path through said printing mechanism, said feed region



having an entrance for manually feeding paper sheets, said tractor for the transport of endless paper arranged under the entrance for the manual feeding and means for releasably receiving at least one cassette for automatically feeding paper sheets, said at least one cassette being detachably arranged above the entrance and inclined obliquely forward relative to said path.

5,066,152

RECORDING APPARATUS WITH MECHANISM FOR CUTTING PRINTED TAPE COVERED BY BACKING TAPE

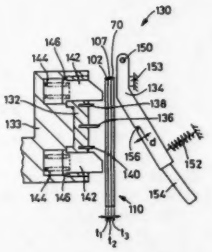
Susumu Kuzuya, Gifu; Seiji Shimizu; Mikio Kato, both of Nagoya; Yujiro Ishikawa, Toyota; Takashi Sakai, Nagoya, and Eiji Yuki, Owariasahi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 21, 1988, Ser. No. 273,984

Claims priority, application Japan, Nov. 28, 1987, 62-181307[U]

Int. Cl.[5] B41J *11/68*

U.S. Cl. 400—621 **14 Claims**



1. A recording apparatus, comprising:

a printing device for printing on a recording tape;

a tape feeding device for feeding a multi-layered tape in the longitudinal direction of said multi-layered tape, said multi-layered tape including a printed length of said recording tape printed by said printing device, and a backing tape superimposed on said printed length via an adhesive layer provided therebetween; and

a cutter mechanism for cutting said multi-layered tape into cut segments, said cutter mechanism comprising a completely cutting blade disposed so as to face said backing tape of said multi-layer tape, for cutting said multi-layered tape through an entire thickness thereof to thereby provide complete cuts which divide said multi-layered tape into said cut segments, and two partially cutting blades disposed on opposite sides of said completely cutting blade, respectively, so as to face said backing tape, in a spaced-apart relation with each other in a direction of feed of said multi-layered tape, to cut only said backing tape, wherein when said completely cutting blade executes two successive cuts of said multi-layered tape through the entire thickness thereof, there are two partial cuts in said backing tape on said cut segment thereby dividing the backing tape into three separate parts on said cut segment, wherein a center part of said divided backing tape may be removed and end parts of said divided backing tape provide gripping means for aligning and initially mounting the cut segments.

5,066,153

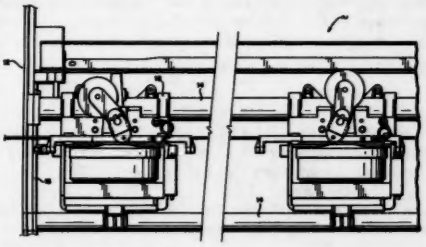
PAPER SHEAR FOR PRINTER

Fred O. Stephens, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Mar. 12, 1990, Ser. No. 491,839

Int. Cl.[5] B41J *11/70*

U.S. Cl. 400—621 **21 Claims**



1. A paper printer, comprising:

a paper shear having a substantially square cutting edge;

means carried by the printer mounting said paper shear for movement traversing the paper in the printer;

a shear platen carried by the printer, said platen having a surface for bearing engagement with the paper being printed and a resisting edge adjacent said surface;

means for selectively engaging and disengaging said paper shear and platen such that, when engaging said platen, said substantially square cutting edge engages the paper and the resisting edge to shear the paper in response to traversing movement of said paper shear; and cam means on said shear platen for selectively pressure engaging said paper shear and said platen such that, when engaging said platen, said paper shear engages the paper to shear the paper in response to traversing movement of said paper shear.

5,066,154

PENCIL SUPPORT FOR SECURITY HAT

J. Maurice Renaud, 7769 rue Tellier, Montréal, Québec, Canada H1L 2Z5

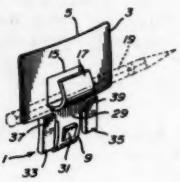
Filed Sep. 21, 1990, Ser. No. 586,208

Int. Cl.[5] B43K *23/02*; A44B *21/00*

U.S. Cl. 401—131 **2 Claims**

1. Device for fixedly mounting a pencil or other article of the same type on a security hat of the type comprising a sheath disposed at the base of said hat, said sheath constituting a cavity which extends from top to bottom and is opened at both ends thereof, the lower end constituting an edge, wherein said device comprises a generally flat member formed with a slight curvature enabling it to rest on the surface of said security hat, hook means formed with said member, said hook means comprising a reversed U shape cut out formed on said flat member, and shaped to constitute a tongue, said tongue being curved to

form a hook, enabling to introduce and hold therein said pencil or said object of the same type, said flat member having a strip intended to be introduced into said cavity, the lower end of said strip extending past the lower end of said sheath, and snapping means preventing the strip from coming out by itself once the latter has been mounted in position in said sheath, said snapping means comprising a first shoulder, which is traversed with respect to said strip, and is formed on a face of the latter



so as to rest against the lower edge of the sheath, a projection of vertical triangular cross-section formed on one face of said strip to contribute to the tightening of the strip in said sheath, said strip being divided into a central part and two terminal parts, the central part comprising said projection with triangular cross-section and said shoulder and the two terminal parts each comprising a triangular thickening, these thickenings contributing to tighten said device into said sheath.

5,066,155

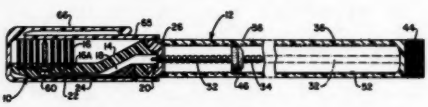
TOOTHBRUSH AND PASTE DISPENSER

Philip H. English, Box 1605, Avon, Colo. 81620, and Anthony D. Szpak, 6215 Jamestown Dr., Parma, Ohio 44134

Continuation-in-part of Ser. No. 237,184, Aug. 29, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 456,721

Int. Cl.[5] A46B *11/00, 11/02*

U.S. Cl. 401—175 **9 Claims**



1. A toothbrush and toothpaste dispenser unit comprising:

a longitudinally extending brush head having bristles, a flexible upright discharge tube terminating near the tips of said bristles, and a longitudinally extending toothpaste receiving and dispensing opening provided therein whereby the opening forms a very shallow open recess along a substantial length of brush head;

a thin closure plate covering the open recess to define with the opening an elongated narrow channel extending a substantial length of the brush head;

a longitudinally extending disposable pre-filled toothpaste receiver and dispenser cartridge having a forward end and a back end, said cartridge at tis forward end engaging said brush head in a sealed relationship, said cartridge containing a toothpaste composed of a glycerin base which has very low thickening or hardening properties and including a rigid outer sleeve which forms a handle for and exterior wall of said unit, said outer sleeve constituting the sole wall thickness in the cartridge portion of said dispenser unit;

a dispensing piston having a radially outwardly flared resilient sealing lip resiliently and sealingly engaging the inner surface of said outer sleeve, said piston having an internally screw threaded opening for receiving a drive screw, an externally threaded drive screw for said piston, means to prevent rotation of said piston, and discharge opening means for permitting flow of toothpaste from said cartridge to said receiving and dispensing opening formed in said brush head;

a rotary drive means for said screw comprising an end cap at the back end of said cartridge for rotatably engaging an end of said screw.

5,066,156

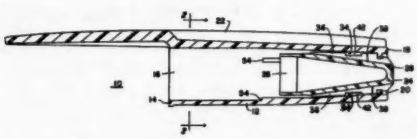
WRITING INSTRUMENT CAP

Richard J. Petrillo, Norwell, and William T. O'Connor, Somerville, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Mar. 19, 1990, Ser. No. 495,864

Int. Cl.[5] B43K *5/00, 9/00*

U.S. Cl. 401—213 **10 Claims**



1. A cap for a writing instrument comprising an outer shell member providing open front and rear ends, a tip seal member having an open front end and a closed rear end, said tip seal member being fixedly positioned substantially within an internal central region of the shell member at the rear end of the shell member to prevent longitudinal movement of said tip seal within said shell member, said outer shell member and tip seal member being separated from each other by a plurality of elongated ribs extending longitudinally between the outer surface of the tip seal member and the inner surface of the shell member to provide a plurality of passageways for air flow between the front and rear ends of the outer shell member, said elongated ribs connecting said tip seal member to said shell member at said rear end of said shell member.

5,066,157

BRUSH APPLICATOR

Lawrence J. Liff, 6025 W. Monroe, Phoenix, Ariz. 85043

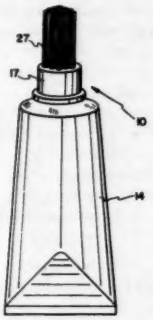
Filed Oct. 10, 1989, Ser. No. 418,573

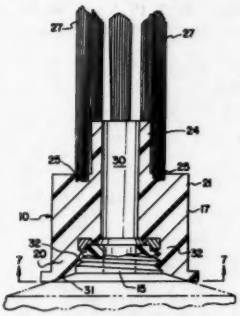
Int. Cl.[5] A46B *11/00*

U.S. Cl. 401—288 **5 Claims**

1. A brush applicator device, for use with a squeeze tube, comprising an annular mounting member, said mounting member having first and second axial end portions, a rigid extension member integrally connected to said second axial end portion and extending axially therefrom, a plurality of bristles permanently connected at one end portion to said second axial end portion and extending outwardly generally parallel to and around and axially beyond an end of said extension member, said extension member having an axial extent of less than one-half the axial extent of such bristles, a generally unobstructed opening extending axially through said annular mounting member from said first axial end portion thereof to said end of said extension member, means at said first axial end portion of said opening for attaching said annular mounting member to the squeeze tube, said end of said extension member being

located within said surrounding bristles and intermediate their end portions whereby material from the squeeze tube will be





delivered to the middle area of said bristles when pressure is applied to said tube.

5,066,158

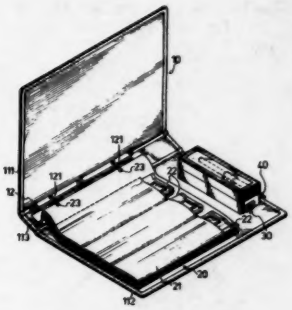
COMBINED NEGATIVE HOLDER AND VIEWING DEVICE

Lai-Jen Huang, Fl. 4, No. 213, Ming-Te Rd., Peitou Dist., Taipei City, Taiwan

Filed Jan. 29, 1991, Ser. No. 647,125
Int. Cl.[5] B42F *5/00*
U.S. Cl. 402—4 **8 Claims**

1. A combined negative holder and viewing device, comprising:

a loose sheet binder including a three-sided rigid folder having a front panel, a rear panel, and a center panel hinged to and provided between said front and rear panels, and a loose sheet retainer mounted on said center panel; and



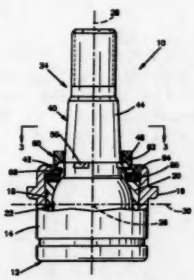
an electrical negative viewing device mounted on said rear panel to provide sufficient electrical lighting to view negatives.

5,066,159

BALL JOINT WITH INTEGRAL SEAL

Brian A. Urbach, Rochester Hills, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Feb. 8, 1991, Ser. No. 652,439
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—134 **13 Claims**



1. Apparatus comprising:

a socket defining a chamber and having an axial end portion defining an opening in said socket;

a ball stud having a ball portion in said chamber and a shank portion projecting through said opening;

a bearing supporting said ball portion in said chamber; and

a seal member for sealing the opening between said socket and said ball stud, said seal member comprising:

a shank seal portion for sealing against said ball stud shank;

a retaining ring; and

a socket seal portion for sealing against said socket, said socket seal portion having said retaining ring molded therein, a first part of said socket seal portion being located between said axial end portion of said socket and said bearing and providing a seal between them.

5,066,160

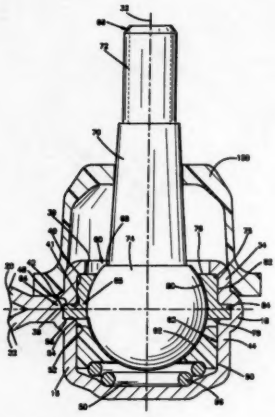
BALL JOINT

Ruey E. Wood, Mount Clemens, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed May 14, 1990, Ser. No. 524,129

Int. Cl.[5] F16C *11/06*

U.S. Cl. 403—140 **9 Claims**



1. A ball joint comprising:

a stud having a ball end and a shank extending from said ball end along an axis of said stud;

a housing containing said ball end, said housing comprising a single piece of sheet metal having a first surface and a second surface, said piece of sheet metal being folded to place said first and second surfaces in overlying relationship to define a seam therebetween, said seam having a length extending circumferentially about said axis; and

a rigid support seat member received in said housing, said support set member having a radially inner surface slidably engaging said ball end and having a radially outer surface portion extending axially across said seam and coextensively with said seam about said axis.

5,066,161

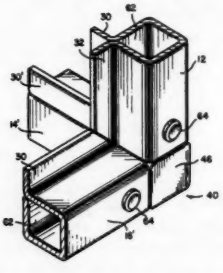
FRAMEWORK FOR CABINET STRUCTURE

Richard C. Pinney, 2110 Deodar St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 348,562, May 8, 1989, Pat. No. 4,954,007. This application Jun. 25, 1990, Ser. No. 543,210

Int. Cl.[5] F16D *1/00*

U.S. Cl. 403—172 **16 Claims**



1. A corner structure for a frame cabinet structure, comprising:

a plurality of structural members, each structure member comprising a substantially closed square shaped tubular member having four walls and four corners therebetween, each tube having a substantially right angle flange at one of said corners, two of said four walls substantially adjacently abutting at said corner but with one wall turning outwardly therefore to form said flange substantially coplanar with the terminal end of the other substantially adjacent abutting wall and said two walls being welded together at said one corner where they substantially abut said plurality of structural members being arranged in an intersecting arrangement, said intersecting structural members having flanges formed such that at least one of said flanges of one of said plurality of structural members mutually abuts with at least one of the flanges of another of said structural members, and

means for securely attaching said plurality of structural members in a rigid corner arrangement.

5,066,162

ATTACHMENT DEVICE

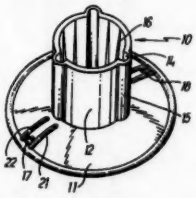
Alan Wall, Stockport; Peter Grayson, Manchester, and Michael Egerton, Rochdale, all of United Kingdom, assignors to Harold Watson Limited, Lancs, United Kingdom

Filed Feb. 15, 1990, Ser. No. 481,370

Claims priority, application United Kingdom, Feb. 15, 1989, 8903455

Int. Cl.[5] B25G *3/02*

U.S. Cl. 403—361 **8 Claims**



8. An attachment device for poles comprising:

a collar, means for attaching a body to a first side of the collar;

a circumferentially closed boss defining a channel with an open end for receiving a pole, at least part of the boss projecting from the side of the collar which is remote from the first side of the collar;

means for securing at least part of a pole to an interior portion of the boss and wherein means of a one-piece construction are provided for enabling the open end of the channel to expand such that the boss is adapted to accommodate poles of different diameters.

5,066,163

RESILIENT SIGN AND GUIDEPOST

Kerry Whitaker, 2905 Deep Valley, Plano, Tex. 75075

Filed Dec. 20, 1990, Ser. No. 632,952

Int. Cl.[5] E04H *17/14;* **E02D** *23/04*

U.S. Cl. 404—10 **7 Claims**

1. A resilient post suitable for use along roadways for marking or supporting roadway signs, comprising:

an elongated flexible hollow tube of resilient plastic material having an annular cross-section configuration;

the hollow tube having a lower end portion terminating in a driving stake means and an upper end portion having at least one partially flattened surface for mounting markers and sign apparatus;

the elongated flexible hollow tube having at least one reinforcing rod mounted interior of the hollow tube and in axial alignment extending from the driving stake means in which the enforcing rod is mounted through a substantial portion of the length of the elongated flexible hollow tube;

the hollow tube having sufficient diameter to allow access to the driving stake means driving head interior of the tube

for driving the combination into the ground by direct driving force contact with the driving head of the driving

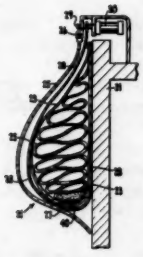
stake means which is interior of the tube walls and exterior of the reinforcing rod.

5,066,164

SPILL CONTAINMENT DEVICE FOR A SHIP

Geza Tomosy, 3900 Fish Hatchery Rd., Allentown, Pa. 18103

Filed Dec. 20, 1990, Ser. No. 630,884
Int. Cl.[5] E02B *15/06*
U.S. Cl. 405—66 **21 Claims**



1. A spill containment device mountable about the hull of a ship, the hull having a keel, substantially vertical walls with outer, uppermost section, and a height defined by a vertical distance between the keel and a top of the vertical walls, the device comprising:

a storage pouch having an interior and an exterior, mounted to the outer uppermost hull section, said pouch including releasable closure means;

a continuous flexible skirt attached at a first skirt edge to said interior of said pouch and having a opposing free skirt edge, the distance therebetween defining a vertical span, said skirt being sized to completely encircle the hull, and when stowed being contained within said storage pouch; and,

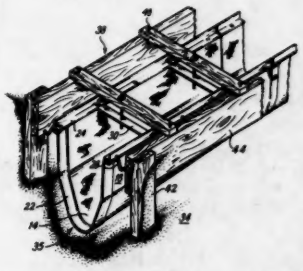
deployment means operable to release said closure means, thereby permitting said opposing free skirt edge to drop from within said storage pouch, said continuous flexible skirt thereby depending from said outer, uppermost section, preventing spread of any released contaminants to the surrounding water.

5,066,165

MODULAR AND COMPONENTIAL TRENCH DRAIN SYSTEM

Ray F. Wofford, 190 Broadmeadow Cove, Roswell, Ga. 30075, and George S. Potter, 7419 Nicole Cir., Charlotte, N.C. 28226

Filed Aug. 13, 1990, Ser. No. 566,975
Int. Cl.[5] E02B *5/00*
U.S. Cl. 405—119 **13 Claims**



1. A forming system for in-ground formation of a trench drain for removing water from a surface comprising at least one channel, a plurality of grate frames, and a grating, said trench drain system being adapted to be supported in-ground by a supporting material formed beneath and outwardly about said drain system in conformity thereto, wherein:

said channel being a generally V-shaped component comprising a bottom wall integrally connected to a pair of opposing, spaced apart sidewalls, thus forming a trough, and a top opening opposite said bottom wall, said bottom wall and sidewalls defining a fluid carrying space and said top opening defining a fluid entrance, said sidewalls terminating in generally horizontal flanges extending outwardly from and perpendicular to said sidewalls directly above and resting on said supporting material;

each of said grate frames being a generally L-shaped component with a bottom horizontal surface of the L being secured to the upper surface of one said flange and a side vertical surface of the L disposed relatively outward from said fluid carrying space; and

said grating being placed on and supported by the interior L surfaces of said grate frames for covering said top opening;

said grating being formed of a relatively strong material sufficient for support of above-ground loads on the surface against entrance into the trough, said channel being formed of a relatively lightweight thin-walled resin material for ease of handling but generally incapable of load-bearing support of said grating and above-ground loads placed thereon, said outwardly-extending disposition of said flanges locating said grate frames above the supporting material for load bearing support of said grating and loads placed thereon substantially entirely by the supporting material.

5,066,166

APPARATUS FOR REMOVING GROUND CONTAMINANTS

Robert G. Hansen, Goleta, Calif., assignor to R. G. Hansen & Associates, Santa Barbara, Calif.

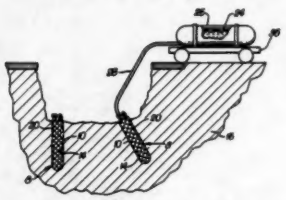
Continuation-in-part of Ser. No. 329,183, Mar. 27, 1989, Pat. No. 4,998,848. This application Oct. 17, 1990, Ser. No. 599,404
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—128 **16 Claims**

1. Apparatus for removing molecules of contamination from a solid material comprising:

a cylindrical container having a top and lateral surfaces for holding a cryo-adsorbing substance, said container having its lateral surface for placement adjacent said solid materials and provided with means for admitting therethrough

molecules of contamination, said means being distributed to admit molecules over substantially the extent of said lateral surface;

a cryo-adsorbing substance located in said container; and



means for cooling said cryo-adsorbing substance with respect to said solid material below a temperature at which molecules of contamination are efficiently cryo-adsorbed by said substance from said solid material.

5,066,167

PRESTRESSED CONCRETE LINING IN A PRESSURE TUNNEL

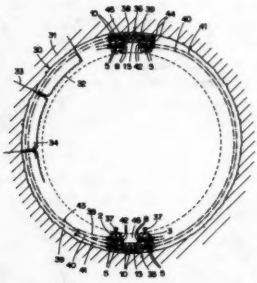
Erwin Siegfried, Liebefeld, and Peter Marti, Belp, both of Switzerland, assignors to VSL International AG, Bern, Switzerland

Filed Jan. 11, 1991, Ser. No. 640,234

Claims priority, application Switzerland, Jan. 19, 1990, 178/90

Int. Cl.[5] E21D *11/10*

U.S. Cl. 405—150.1 **13 Claims**



1. A prestressed concrete lining in a pressure tunnel, with several reinforcement cages (32) distributed around the circumference and along the pressure tunnel and bordering at least partially on each other, with prestressing elements (38, 39, 40, 41), which encompass at least a part of the circumference of the pressure tunnel, with stressing anchorages (42) to stress the prestressing elements, the stressing anchorages being accessible from the inside of the tunnel, and with a bottom part (35) extending along the length of the pressure tunnel, formed of several individual anchorage bodies in series, whose side surfaces are each bordered by reinforcement cages, wherein each of the anchorage bodies (1, 15, 19) has an essentially U-shaped cross section with a pair of extending arms at a distance from each other which are connected with each other at their base by a base arm, wherein each of the extending arms (2,3) of the anchorage bodies turned towards the inside of the tunnel there are a first pass-through means (5,20) for at least one of each of the prestressing elements (38, 39, 40, 41), a bearing plate (8) being disposed on the facing inner surfaces of the arms in the region of each of the first pass-through means (5, 20), and wherein the base arm there are second means (10, 21) for passing through at least one each of the prestressing elements (38, 39, 40, 41), starting from a dead end anchor (43), is fed through one of the second pass-through means (10, 21) of one of the anchorage bodies and, after crossing through one of the first pass-through means (5, 20) of one of the anchorage bodies, ends in an anchor head (48) of a stressing anchorage (42) adjacent to one of the bearing plates (8).

5,066,168

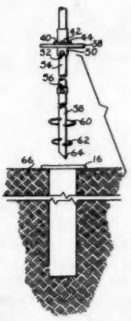
CYLINDRICAL FOUNDATION SUPPORT DRIVABLE INTO GROUND WITH REMOVABLE HELIX

Maynard L. Holdeman, Centralia, Mo., assignor to A.B. Chance Company, Centralia, Mo.

Filed Mar. 5, 1991, Ser. No. 664,944

Int. Cl.[5] E02D *7/28*

U.S. Cl. 405—249 **16 Claims**



1. In a foundation earth anchor and installation unit, the combination comprising:

a cylindrical foundation support which is open at opposite ends thereof and adapted to at least partially be embedded into the ground;

an installation drive component removably positioned within the support and provided with an element extending longitudinally of the support and projecting outwardly from one end thereof; and

means for releasably coupling the installation drive component to the foundation support whereby upon rotational movement of the drive component, the foundation support is rotated therewith,

said installation drive component further including helix means on the end of the element which projects outwardly from said one end of the support so that upon application of a rotational force to the assembled foundation support and drive component while a down force is applied to such assembly, the helix means on the element causes the support and drive assembly to be pulled into the ground, and

guide means on the element and engagable with the foundation support for maintaining axial alignment between the foundation support and the drive component during installation of the foundation and cooperable with said helix means to cause the foundation and drive component to be drawn into the ground during rotation of the foundation support and drive component assembly, whereby

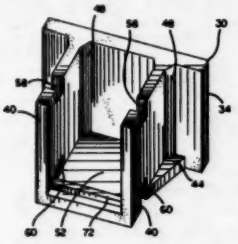
after the foundation support has been forced into the ground to a desired level, the drive component may be disconnected from the foundation support and removed by rotation thereof in a direction opposite to the direction of installation of rotation leaving the foundation support in the ground.

5,066,169

RETAINING WALL SYSTEM

Norman W. Gavin, 2545 Ridge Rd., North Haven, Conn. 06473, and Felix P. Jaecklin, 46 Geissbergstr, CH 5400 Ennetbaden, Switzerland

Filed Feb. 19, 1991, Ser. No. 656,914
Int. Cl.[5] E02D *29/02*
U.S. Cl. 405—284 15 Claims



1. A retaining wall system comprising:

a first module, the front of said module comprising a first wall,

said first wall being vertical and including a front, a back, a top, a bottom, a first end, and a second end,

said first module further comprising:

a second wall,

said second wall being horizontal and including a front, a back, a top and a bottom, and being attached to the bottom of said first wall along a substantial length of the back of the first wall,

a third wall,

said third wall being upstanding and being attached to the back of the first wall, to the top of the second wall, and depending back from the first wall,

a fourth wall,

said fourth wall being upstanding and being attached to the back of the first wall, to the top of the second wall, depending back from the first wall, and spaced from the third wall,

said third and fourth walls being parallel with one another, and comprising parallel, horizontal transitions in their attachments with said second wall,

the top of said first wall being generally coplanar with the tops of said third and fourth walls, and

the bottoms of said first and second walls being generally coplanar.

5,066,170

TOOL BIT

Michel Berryer, Cadillac, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 407,331, Sep. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 252,595, Oct. 3, 1988, abandoned. This application Apr. 10, 1991, Ser. No. 684,432
Int. Cl.[5] B26D *1/12*
U.S. Cl. 407—54 17 Claims

1. A tool bit comprising a shank fabricated of "Sheffield #20 T.G.P." steel and including a cylindrical base portion having an axis and a diameter, an elongated end portion of generally cylindrical shape and having an axis extending coaxially with said axis of said base portion, and an outer cylindrical periphery extending for substantially the entire length of said end portion and having a constant diameter less than said diameter of said base portion, said end portion including therein a recess extending lengthwise of said end portion and being of right angle shape in a cross-section extending transversely of said end portion axis, said recess cross-section being defined by a long face extending in parallel spaced relation to a radius extending from said end portion axis and including an outer end at said cylindrical outer periphery and an inner end, and a short face extending from said inner end to said cylindrical outer periphery, and a connecting portion joining said end portion and said base portion and tapering from said base portion diameter to said end portion diameter, said connecting portion including an outwardly concave tapering surface having an exponential profile with a minimum radius adjacent said base portion and a maximum radius adjacent said end portion, said connecting portion also including a recess extension defined by a flat surface extending from said short face, and a curving surface extending from said long face, and an insert fabricated of carbide and having a transverse generally rectangular cross-section with a length extending along said short face and beyond said outer cylindrical periphery of said end portion, said insert including a main portion in said recess in

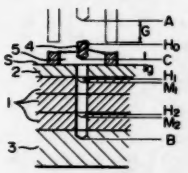
said end portion of said shank and including an exposed flat surface, an inner flat surface brazed to said short face of said recess, an inner edge surface brazed to said long face of said recess, and an outer edge surface which extends parallel to said inner edge surface, said insert also including an end portion extending from said main portion and including a flat exposed surface extending from said exposed surface of said main portion and an inner surface which is brazed to said shank and which has a first part extending in spaced generally parallel relation to said exposed surface of said insert end portion and a second part which curves from said first part toward, and intersects with, said exposed surface of said insert end portion, said insert being sharpened to provide a cutting edge.

5,066,171

METHOD FOR DRILLING A PRINTED CIRCUIT BOARD

Kunio Arai, Atsugi; Hiromi Nishiyama, Ebina; Hiroshi Aoyama, Tokyo, and Yasuhiko Kanaya, Machida, all of Japan, assignors to Hitachi Seiko Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 106,439, Oct. 9, 1987, Pat. No. 4,872,787. This application Mar. 17, 1989, Ser. No. 324,769
Claims priority, application Japan, Dec. 19, 1986, 61-301285
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[5] B23B *35/00*
U.S. Cl. 408—1 R 10 Claims



1. A method for drilling a hole in a workpiece, comprising the steps of:

moving a pressure foot associated with a drill into contact with the workpiece, and

moving a drill bit associated with the drill from a drill-starting position in to the workpiece, toward the drill-starting position and again into the workpiece while maintaining

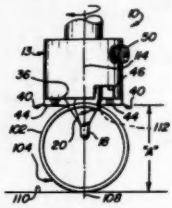
the pressure foot in constant contact with the workpiece, wherein the drill bit movement produces a hole with a high aspect ratio of at least 8 as defined by the length of the hole to the hole diameter.

5,066,172

COUNTERSINK TOOL ASSEMBLY

Ollie C. Swim, Jr., 18255 Westmore, Livonia, Mich. 48152

Filed Jul. 31, 1990, Ser. No. 560,364
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—1 R **13 Claims**



12. A method of concentrically cutting a chamfer around a hole drilled into a curved exterior surface of a workpieces, said method comprising the steps of:

securing a countersink tool assembly to a drill apparatus for rotation about a central axis, said countersink tool assembly having cutting means for cutting the chamfer upon rotation thereof, and contact surface means displaced from said cutting means and adapted to define a line of contact with the curved exterior surface of the workpiece during cutting of the chamfer, said contact surface means comprising a pair of diametrically opposed ears formed on said first transverse end surface of said insert member;

securing the workpiece with respect to said central axis of said countersink tool assembly such that a centerline of the drilled hole is colinear with said central axis;

rotating said countersink tool assembly about said central axis;

engaging said contact surface means with the curved exterior surface of the workpiece;

maintaining engagement between said contact surface means and said curved exterior surface such that rotation of said countersink tool assembly causes said countersink tool assembly to translate rectilinearily with respect to said centerline of the drilled hole whereby said cutting means cut the chamfer having a substantially uniform cross-section around the circumference of the drilled hole.

5,066,173

ALUMINUM PISTON WRIST PIN BORING TOOL

Charles Gaffan, Windsor, and Bruno K. Schwarzpech, Harrow, both of Canada, assignors to GTE Valenite Corporation, Troy, Mich.

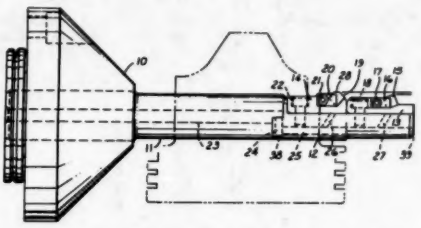
Filed Jan. 31, 1990, Ser. No. 472,913
Int. Cl.[5] B23B *41/12*
U.S. Cl. 408—59 **11 Claims**

1. An aluminum wrist pin boring tool having an axis of rotation, comprising:

a. an adapter;

b. a shank attached to said adapter and concentric therewith, said shank passing through said adapter and having a passage extending longitudinally through the length of said shank;

c. a cartridge means for mounting semi-finish and finish boring inserts characterized by said finish inset having a cutting tip with a linear flat cutting edge, said cartridge means being attached concentrically with said shank and having a series of interconnecting branch passages, said branch of passages in communication with said shank passage and open at the cartridges to allow flow of coolant through to the boring inserts, said semi-finish insert positioned ahead of center with approximately a 5° negative effective radial rake and a 5° positive axial rake, and said finish insert having approximately a 5° negative effective radial rake and a neutral "0" axial rake, said finish insert further characterized in that said flat cutting edge extends in a closely held range from a line parallel to said axis to a ½° backward outward slope.

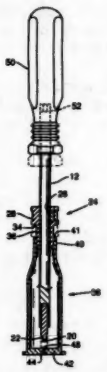


5,066,174

CARTRIDGE CASE FLASH HOLE FINISHING TOOL

Randy L. Smith, Centre Hall, Pa., assignor to Blount, Inc., Portland, Oreg.

Filed May 3, 1990, Ser. No. 518,755
Int. Cl.[5] B23B *41/00*
U.S. Cl. 408—79 **8 Claims**



1. A tool for finishing a pre-bored flash hole aperture in a base at one end of a cartridge case, the case having an opening at its opposite end defining the entry into a cylindrical neck portion, said opening spaced from said flash hole aperture, said cylindrical neck and aperture coaxial with the longitudinal axis of the case, said tool comprising:

an elongate shank having a longitudinal axis, a pilot fixedly positioned on the shank, an outer surface of the pilot having a top and bottom and configured to fit in sliding engagement with the interior of the neck, a burr-removing, hole-finishing cutter on an end of the shank spaced from said pilot bottom a distance less than the spacing between the entry and flash hole aperture of the cartridge case, said cutter and pilot outer surface coaxial with the axis of the shank;

said outer surface of the pilot mated to the interior of the cartridge case neck whereby extension of the pilot into the cartridge case neck maintains a coaxial relationship of one to the other and thereby guides the cutter from a position short of the aperture to a position within the pre-bored

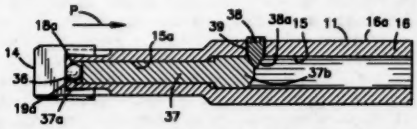
aperture to be worked therein for removing burrs from the aperture periphery.

5,066,175

CUTTING TOOL ASSEMBLY

Carl M. Newman, 61 Birch Ave., Northfield, Ohio 44067

Filed Oct. 26, 1990, Ser. No. 603,956
Int. Cl.[5] B23B *51/00*
U.S. Cl. 408—231 **11 Claims**



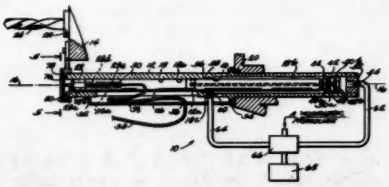
1. A cutting tool assembly for a cutting operation such as reaming or the like, said tool assembly comprising, in combination: a substantially cylindrical holder member having an outer surface, a front end, a rear end, and a central bore, said front end having a diametrically extending slot to form a pair of oppositely disposed, flexible arms; a cutting blade having cutting edges and an outwardly opening recess for accommodating said front end of said holder member to position said cutting blade for a cutting operation; and means in said holder member central bore for variably spreading said pair of arms radially outwardly in opposite directions into clamping engagement with said cutting blade on said holder member front end, thereby retaining said cutting blade for said cutting operation; wherein said cutting blade is of U-shaped configuration having a bight portion and a pair of leg portions defining said recess and means on each of said oppositely disposed arms for slidably accommodating a respective one of said leg portions in said cutting position of said blade.

5,066,176

PROBE FOR MACHINE TOOL

Richard Johnstone, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Continuation of Ser. No. 63,451, Jun. 18, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,470
Int. Cl.[5] B23C *1/02*
U.S. Cl. 409—133 **6 Claims**



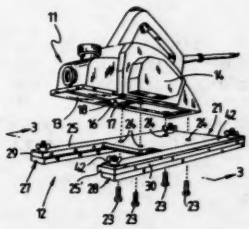
1. In combination, a workpiece surface measuring probe and a machine tool having a rotary spindle adapted to drive a cutting tool to machine a workpiece, said spindle mounted extending in a direction away from a spindle head, said spindle head movable along coordinate axes of said machine tool, and a controller monitoring the coordinate position of said spindle head along said coordinate axes; mounting means mounting said probe on said spindle head to move therewith, said probe characterized by the improvement comprising sensing means including a stylus and means for generating a signal while said stylus contacts a workpiece surface as said spindle head is moved, and further including means transmitting said signal to said controller to detect the spindle head coordinate position along said coordinate axes when said stylus makes contact with said workpiece surface; said mounting means including an elongated member having said stylus affixed to one end thereof and retracting means selectively retracting said elongated member to position said stylus adjacent said spindle head when said cutting tool is machining said workpiece and extending means extending said elongated member to a fixed, extended position out from said spindle head in the direction in which said spindle extends, whenever said workpiece is to be measured; and, locating means acting on said elongated member to locate said stylus spaced away from said spindle head in a single unique precisely repeatable position with respect to said spindle head whenever said elongated member moves to said extended fixed position, whereby said controller can accomplish coordinate measurements of a workpiece by movement of said spindle head without removal of a cutting tool from said spindle.

5,066,177

ATTACHMENT TO A PORTABLE POWER PLANAR

John H. Brown, Jr., P.O. Box 473, Spanish Fort, Ala. 36527

Filed Dec. 10, 1990, Ser. No. 624,589
Int. Cl.[5] B27C *5/10*
U.S. Cl. 409—178 **12 Claims**



1. An attachment for producing a scarf cut of a particular angle in plywood or like material, when used with a portable power planer of the type having a body encased within said body a motor for driving a cutter having cutting blades rotably mounted about an axis transverse to said body, comprising:

(a) a mounting plate detachably secured subjacent a bottom surface of said body, said mounting plate defining an elongated opening which extends from the front of said planer to a point rearwardly of the cutter;

(b) first elongated member connected to said mounting plate subjacent a first longitudinal edge portion of said mounting plate and having a wedge shape tapering downwardly from said elongated opening; and

(c) second elongated member connected to said mounting plate subjacent a second longitudinal edge portion of said mounting plate parallel to said first elongated member and having a wedge shape tapering downwardly toward said elongated opening, each of said elongated members being of equal height such that said mounting plate is supported therein at an angle corresponding to the taper of said elongated members.

5,066,178

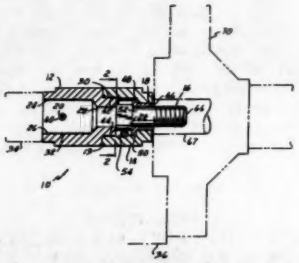
DRAW BAR ADAPTER STRUCTURE FOR AND METHOD OF SECURING A TOOL TO A SPINDLE

Bruce G. Peuterbaugh, Mt. Clemens, Mich., assignor to J. P. Tool, Inc., Warren, Mich.

Filed May 17, 1982, Ser. No. 379,254
The portion of the term of this patent subsequent to Apr. 19, 2003, has been disclaimed.
Int. Cl.[5] B23C *5/26*; B23Q *3/12*
U.S. Cl. 409—233 **13 Claims**

12. The method of securing a tool, having a tool draw bar carried by and movable axially of the tool to a spindle having an actuating draw bar movable axially thereof, therein comprising, securely securing the tool draw bar to the actuating draw bar by rotating the tool relative to the spindle in one

direction until the tool and spindle are in surface to surface contact precluding relative axial movement between the tool and spindle and the draw bars, subsequently reversely rotating



the tool relative to the spindle with the tool and spindle in surface to surface contact and without loosening the connection between the draw bars to angularly align the tool with the spindle, and then securing the tool to the spindle.

5,066,179

BLIND FASTENER

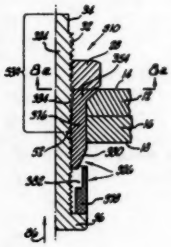
John D. Pratt, Rancho Cucamonga, Calif., assignor to MAG Aerospace Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 583,029, Feb. 23, 1984, abandoned. This application Feb. 12, 1986, Ser. No. 828,781

The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—34 **4 Claims**



1. A wrench and fastener combination comprising:

a blind fastener for mounting in aligned openings through two workpieces to connect them together in overlapped outer and inner relation, the fastener including:

an internally threaded, generally tubular fastener body received within the openings in the workpieces having,

an inner end projecting inwardly beyond the inner workpiece, and

an enlarged body head engaging the outer workpiece;

an externally threaded cylindrical stem passing in threaded engagement through said fastener body, turning motion of said stem relative to said fastener body in one direction moving said stem in an axially outward direction through said body, said stem having,

an enlarged stem head spaced from the inner end of said fastener body, and

a wrench engaging region spaced outwardly from said fastener body head;

a deformable sleeve around said stem in contact with said stem head, movement of said stem outwardly through said fastener body deforming said sleeve to a fully set condition in overlying contact with the inner surface of the inner workpiece;

a drive nut separate from said fastener body threadedly mounted on said stem in contact with said body head restraining said fastener body from turning in the workpieces, at least one of said drive nut and said body head being knurled to increase the friction between said drive nut and said body head;

first wrench means engaging said drive nut for holding it against rotation;

second wrench means engaging said wrench engaging region for applying turning force to turn said stem in the one direction relative to said drive nut;

a localized weakened region in said stem at an axial location positioned substantially flush with an outer surface of said body head when said sleeve is fully set; and

an outer portion of said stem extending outwardly of said weakened region through said drive nut, said outer portion with said drive nut attached being twisted off at said weakened region by continued application of turning force to said outer portion of said stem in the one direction after said sleeve is fully set.

5,066,180

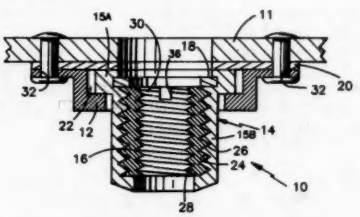
EASY ACCESS NUTPLATE

Charles F. Lang, 88 Lynn Dr., Monroe, Conn. 06468, and Henry E. Konopka, 8 Laura La., Oxford, Conn. 06483

Filed Dec. 7, 1990, Ser. No. 624,372

Int. Cl.[5] F16B *37/04, 37/08, 39/00*

U.S. Cl. 411—103 **3 Claims**



1. A nutplate assembly, comprising:

a nut element, comprising a shank having external threads and a coaxially attached, rectangularly shaped head having a larger diameter than said shank;

a retaining base, adapted to accept a portion of said nut element and to limit rotation of said nut element;

an insert, adapted to be positioned within said nut element, having an internally threaded portion and having an externally threaded portion for mating with threads of said shank; and

a lip on said nut element for attaching a snap ring to retain said insert axially within said nut element.

5,066,181

ATTACHMENT ELEMENT WITH LARGE WASHER

Gerhard Bögel, Balgach, Switzerland, assignor to Stadler AG, Heerbrugg, Switzerland

PCT No. PCT/EP88/00020, § 371 Date Sep. 21, 1988, § 102(e) Date Sep. 21, 1988, PCT Pub. No. WO88/05487, PCT Pub. Date Jul. 28, 1988

PCT Filed Jan. 13, 1988, Ser. No. 274,058

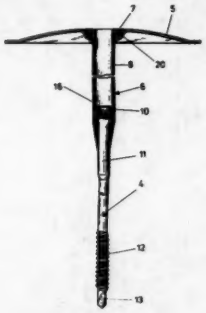
Claims priority, application Austria, Jan. 21, 1987, 104/87

Int. Cl.[5] F16B *35/02*

U.S. Cl. 411—383 **38 Claims**

1. An attachment element having a large washer and a tubular extension formed on the washer for the passage and guidance of a screw, wherein the washer (5) and the tubular extension (6) are formed as parts separate from each other, and wherein the said tubular extension (6) exhibits, at its end facing the washer, a shoulder (7), and wherein a section (8), adjoining this end area, of the tubular extension (6), corresponds approximately to the passage cross-section of an opening (9) in the

washer (5), wherein the free inside diameter of the extension (6) corresponds, along its greatest length, approximately to the outside diameter of a head (10) of the screw (4) to be inserted, and wherein the free end (17) of the extension is narrowed to



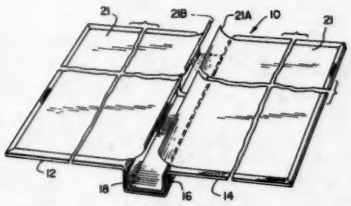
the shank or outside diameter of the thread to the screw to be inserted to produce a friction-contact mounting between the extension (6) and the inserted screw such that the said tubular extensions with the inserted screws can be prestored in a magazine.

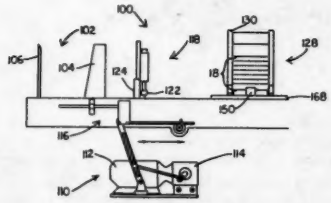
5,066,182

APPARATUS AND METHOD FOR ASSEMBLING A COVER CASE AND BINDER

Richard L. Stonebraker, and James Lasley, both of Crawfordville, Ind., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Aug. 30, 1991, Ser. No. 575,218
Int. Cl.[5] B42C *7/00*
U.S. Cl. 412—3 **13 Claims**





1. An apparatus for assembling a cover case and a channel for binding pages in said cover case, comprising:

a hopper for holding a plurality of cover cases, said hopper including an inlet for loading cover cases in said hopper and an outlet for removing cover cases from said hopper;

an adhesive applicator adjacent said hopper;

a moving assembly including a pusher for moving said cover cases from said hopper through said outlet to said adhesive applicator;

said adhesive applicator including an adhesive dispenser for dispensing adhesive onto at least a portion of each of said cover cases;

a cartridge adjacent said adhesive applicator for holding a plurality of channels;

a channel applicator adjacent said cartridge wherein said channel applicator further includes a first side clamp and a second side clamp and an activator for clamping said first side clamp and said second side clamp on a portion of said cover case around said channel;

a first conveyor extending from said adhesive applicator to said channel applicator for moving said cover cases from said adhesive applicator to said channel applicator; and

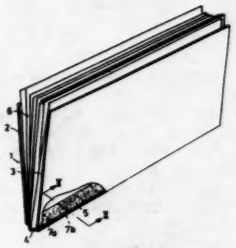
an actuator coupled to said channel applicator for actuating said channel applicator to remove a channel from said cartridge and apply said channel onto said adhesive on said cover case.

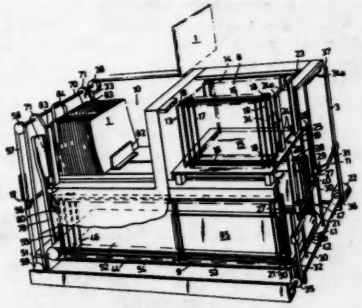
5,066,183

METHOD FOR BINDING SHEAVES OF PAPER INTO COVERS

Jan Tholérus, Iäby, Sweden, assignor to Bindomatic AB, Stockholm, Sweden

Filed Jan. 5, 1990, Ser. No. 461,280
Claims priority, application Sweden, Sep. 15, 1989, 8903049
Int. Cl.[5] B42C *11/00*
U.S. Cl. 412—4 **18 Claims**





1. A cover comprising two cover sheets and a spine therebetween, a binding agent attached to the inside of the spine, a sheaf of papers being intended to be inserted in the cover between the two cover sheets, such that one side edge of the sheaf of papers bears against the side of the binding agent farthest away from the spine, the binding agent being intended to be activated for connecting the sheaf of papers to the inside of the spine via the binding agent, and automatically readable metallic indication means associated with the cover.

6. A method for binding sheaves of papers into covers such as to form booklets, each booklet comprising a cover made up of two cover sheets, a spine therebetween, indication means associated with the cover, a binding agent attached to the inside of the spine, and a sheaf of papers inserted in the cover, one side edge of the sheaf being positioned adjacent to the

inside of the spine, comprising the steps of activating the binding agent by an activation device such that said side edge of the sheaf of papers will be connected to the inside of the spine via the binding agent, and sensing the non-presence of the indication means on the cover using a sensing means to thereby activate a control means for preventing binding of the sheaves in the absence of the indication means.

5,066,184

METHOD FOR SEAMING PACKED CANS

Yoshiharu Taura, Takasago; Yoshinori Yuzaki, Hiroshima, and Koichi Takagi, Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 297,937, Jan. 17, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 616,804

Int. Cl.[5] B21D *51/32*

U.S. Cl. 413—4 **1 Claim**

1. A method of seaming a can lid to a can body, said method comprising:

clamping said lid and body between a chuck rotated by drive means and a lifter having a rotary axis coincident with a rotary axis of said chuck, thus forming a clamped assembly;

rotating said clamped assembly about said coincident axes while maintaining a clamping force between said lid and body;

moving a roll having a peripheral groove from a first position spaced from the thus rotating clamped assembly in a direction perpendicular to said coincident axes to a second position pressing against an edge portion of said lid and thereby deforming said edge portion and an edge portion of said body to form a sealed seam therebetween; and

maintaining said roll during said movement thereof and at both said first and second positions thereof at an orientation relative to said coincident axes wherein said rotary axis of said roll is inclined relative to said coincident axes, said maintaining comprising positioning said roll in a constant orientation such that said rotary axis thereof always is located in planes parallel to said coincident axes and tangential to cylindrical surfaces centered about said coincident axes.

5,066,185

BAR FEEDER

Giovanni Cucchi, Bussero, Italy, assignor to Cucchi Giovanni & C. S. R. L., Bussero, Italy

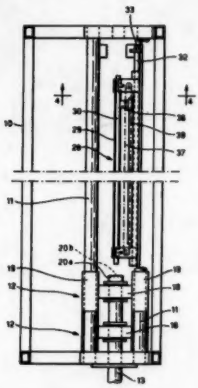
Filed Nov. 20, 1989, Ser. No. 438,963

Claims priority, application Italy, Nov. 21, 1988, 22680 A/88

Int. Cl.[5] B23B *13/08;* **B23Q** *5/22*

U.S. Cl. 414—18 **6 Claims**

1. A bar feeding device for machine tools comprising: a support structure having a longitudinal axis, slide guides for at least a first and a second carriage rotatably supporting a bar to be fed and guided toward a machine tool mandrel, first control means to move said carriages along said slide guides parallel to said axis, said device further comprising first and second bar pushing means (**20***a* and **30, 41**) for pushing a bar along said axis, said first pushing means (**20***a*) being provided on one of said carriages and remaining always on said axis, and second control means to move said second pushing means independently of said first pushing means, said second pushing means and second control means being movably supported on said



support structure for movement between an inoperative position in which said second pushing means is laterally offset from said axis and an operative position in which said second pushing means is aligned with said axis.

5,066,186

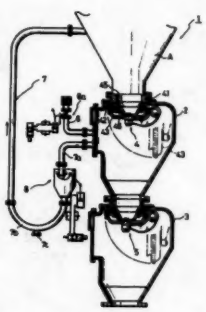
DUST DISCHARGING APPARATUS FOR A FURNACE

Kazumi Shimada, and Masaaki Chikazawa, both of Tokyo, Japan, assignors to Azuma Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,918

Int. Cl.[5] F16K *1/20*

U.S. Cl. 414—221 **5 Claims**



1. A dust discharging apparatus comprising: series-connected upper and lower dust shoot chambers, said upper dust shoot chamber being connected to a lower discharging end of a dust hopper, each dust shoot chamber having a swingable discharging valve device to close and open its ceiling opening, said swingable discharging valve device comprising: a dependent hollow cylinder extending down from the ceiling of each of said upper and lower dust shoot chambers; a downstream-convergent throttle ring integrally connected to the inside of said dependent hollow cylinder; a valve seat integrally connected to the outside of said dependent hollow cylinder; and a swingable valve having a concave plate large enough to accommodate a downstream end of said dependent hollow cylinder when said plate is closed to sit on said valve seat, and an

upstream-divergent bucket fixed to said concave plate, the upstream-divergent opening of said bucket being somewhat larger than the downstream-convergent opening of said throttle ring.

5,066,187

PARKING SYSTEM AND METHOD OF AUTOMATICALLY PARKING MOTOR VEHICLES

Hans Hammer, Sylvensteinstrasse 2, 8000 Munich 70, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 476,694
Continuation of PCT/EP8900618, Jun. 2, 1989, abandoned.
Int. Cl.[5] E04H *6/12*
U.S. Cl. 414—237 **13 Claims**

1. A parking mechanism for automatically parking motor vehicles (**40**) on at least two vertically stacked horizontal parking levels (P1, P2) each including a plurality of intersecting parking rows (Z1–Z12) and parking columns (RA–RK), an entrance zone (EZ) and an exit zone (AZ), the parking rows being arranged parallel to the entrance zone and the exit zone in a y-direction and the parking columns being arranged perpendicular thereto in an x-direction, comprising

(a) a plurality of motor vehicle pallets (**41**) for supporting motor vehicles within the parking levels;

(b) first means for driving said pallets in the x-direction from an entrance row (**Z3**) to an exit row (**Z10**);

(c) means for driving said pallets in the y-direction transverse to the columns (RA–RK); and

(d) a plurality of lifting units (**20, 21**) for driving said pallets vertically in a z-direction between the parking levels, said lifting units being arranged in the entrance row and in the exit row for each parking column, respectively, each lifting unit including

(1l) an x-driving mechanism in a lowermost parking level, said x-driving mechanism having second x-driving means for moving said pallets solely in the x-direction; and

(2) third x-driving means (**96**) in the upper parking levels for moving said pallets solely in the x-direction, said third xdriving means being movable beneath said pallets into and out of a lifting path.

5,066,188

APPARATUS FOR LOADING AND UNLOADING OPEN TOP RAILROAD CARS

David E. Bush, Rte. 1 Box 77, Gary, Tex. 75643, assignor to David E. Bush, Gary, Tex.

Filed May 17, 1990, Ser. No. 525,978
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—339 **6 Claims**

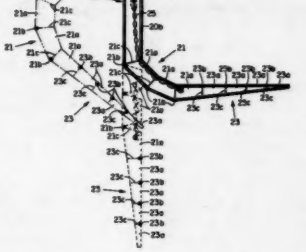
4. An apparatus for supporting a material handling machine and loading and unloading an open top railroad car resting on rails supported by a rail bed, said apparatus comprising a support structure having at least two structure beam members disposed in spaced, parallel relationship; attachment pin means provided in each of said structure beam members for removably securing the material handling machine on said structure beam members; at least two structure end members carried by each end of said structure beam members in spaced, transverse relationship: and stabilizing means mounted in adjustable relationship on said structure end members for adjustably engaging the sidewall upper surfaces of the sides of the open top railroad car; winch means rotatably mounted in said support structure whereby one of said structure end members is rested against the open top railroad car with the opposite one of said structure end members engaging the railroad bed, the material handling machine is attached to said structure beam members, the material handling machine being operable relative to the railroad bed so as to elevate the said opposite one of said structure end members from its position engaging the railroad bed to a position where the support structure is generally parallel and level with the open top railroad car, and then said winch is operable to pull said support structure with said material handling machine thereon onto the sidewall upper surface of the sides of the open top railroad car.

5,066,189

METHOD AND APPARATUS FOR HANDLING DISCRETE CARGO UNITS

Melvin E. Shell, Stephenville, Tex., assignor to Shell Material Handling Systems, Inc., Stephenville, Tex.

Filed Aug. 3, 1990, Ser. No. 562,196
Int. Cl.[5] B66F *9/00*
U.S. Cl. 414—416 **20 Claims**



1. A fork for handling a rectangular stack of cargo units without a pallet comprising:

a rectangular suspension frame having horizontal dimensions approximating those of the rectangular stack;

means on said suspension frame for attachment to crane cables for lowering and raising said suspension frame;

a plurality of forks;

each fork having a rigid upper portion and an articulated lower portion movable between a substantially 90° load carrying position relative to said upper portion and a substantially longitudinally aligned, load releasing position relative to said upper portion;

means spaced along two opposed sides of said suspension frame for horizontally pivotally mounting said upper portions of said forks, whereby one set of said forks is disposed along one side of said stack and a second set of said forks is disposed along the opposite side of said stack;

first power means for concurrently shifting said lower fork portions relative to said upper fork portions from said load releasing position to said load carrying position; and

second power means for concurrently shifting said upper portions of said forks from an angularly inclined vertical position wherein said opposed sets of forks clear said

stack, to a substantially vertical position wherein both sets of said lower fork portions move under said stack in their load carrying positions, whereby said stack may be lifted and moved to another location by said suspension frame.

5,066,190

DEVICE TO PALLETIZE YARN PACKAGES

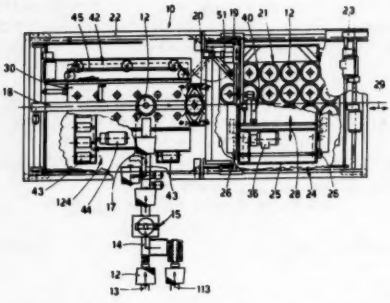
Armando D'Agnolo, Porcia, Italy, assignor to Matics Srl, Pordenone, Italy

Filed Dec. 6, 1989, Ser. No. 446,664

Claims priority, application Italy, Dec. 23, 1988, 83552 A/88

Int. Cl.[5] B65G *57/16*

U.S. Cl. 414—799 **13 Claims**



1. A device to palletise yarn packages which is suitable for installation downstream of machines that produce such yarn packages, the yarn packages being engaged substantially at the outlet of their production machine so as to be loaded in an orderly manner on means for supporting the yarn packages, the palletisation device comprising:

a movable support structure able to support additional structures;

means, mounted on said movable support structure, for transferring said yarn packages onto said movable support structure;

means, mounted on said movable support structure, for engaging and moving said yarn packages and for positioning said yarn packages on said means for supporting the yarn packages

means, mounted on said movable support structure for engaging, moving and positioning cardboard sheet supports and pallets; and at least two side-by-side work stations provided. on said movable support structure, each of said work stations including means for supporting and moving at least one of yarn packages and cardboard sheet supports for movement in two directions, said two directions being orthogonal to a direction of forward movement of the movable support structure, whereby this orthogonal movement in two directions permits work to be carried out on both sides of the device.

5,066,191

TURBINE WITH CONTROL SYSTEM

Wolfgang Wuehrer, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

PCT No. PCT/CH88/00209, § 371 Date Jul. 13, 1989, § 102(e) Date Jul. 13, 1989, PCT Pub. No. WO89/05402, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 11, 1989, Ser. No. 392,938

Claims priority, application Switzerland, Nov. 30, 1987, 4664/87

Int. Cl.[5] F04D *15/02*

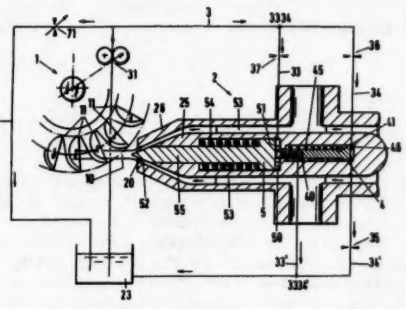
U.S. Cl. 415—35 **15 Claims**

1. In combination,

a turbine having a plurality of circumferentially disposed blades;

a needle valve for directing a water jet onto said blades for rotating said turbine, said valve including a first housing having a nozzle at one end for expelling a water jet therefrom, a control piston slidably mounted in said housing to control the water jet passing through said nozzle, a first chamber behind said piston relative to said nozzle, a pilot piston slidably mounted in said housing coaxially of said control piston, and a second chamber behind said pilot piston relative to said nozzle;

a hydraulic pump drivingly connected to said turbine to be



driven thereby for pumping a flow of oil therethrough at a pressure dependent on the speed of said turbine;

a first branch line between said pump and said first chamber for delivering oil thereto;

a first orifice plate in said first branch line to throttle the flow of oil therethrough;

a second branch line between said pump and said second chamber for delivering oil thereto; and

a second orifice plate in said second branch line to throttle the flow of oil therethrough.

5,066,192

OIL SEALING SYSTEM FOR A TURBO CHARGER

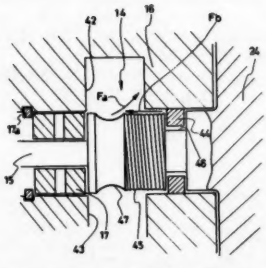
Mamoru Honda, and Ken Shirato, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 19, 1990, Ser. No. 511,210

Claims priority, application Japan, Apr. 19, 1989, 1-46083; Jun. 6, 1989, 1-66102; Jun. 27, 1989, 1-75097

Int. Cl.[5] F01D *11/00, 25/00*

U.S. Cl. 415—112 **5 Claims**



1. An oil sealing system for a turbo charger comprising:

a housing;

a shaft rotatably supported by the housing via a bearing;

a turbine-rotor fixed to one end of the shaft;

a compressor-rotor fixed to the other end of the shaft;

an oil conduit formed in the housing for supplying oil between the shaft and the bearing for lubrication; and

an oil sealing means for preventing oil leakage to the turbine-rotor;

the oil sealing means including:

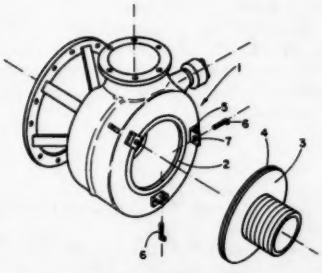
a depression formed in the housing;
a drain formed in the housing;
a ring-shaped depression formed on the shaft, wherein the ring-shaped depression has a taper portion and a vertical portion;
a groove formed on the shaft;
a seal-ring located between the housing and the groove; and
a directing means for directing oil away from said turbine-rotor, wherein said directing means comprises a screw formed on the outer circumferential portion of the shaft between the groove and the ring-shaped depression;
wherein the bearing defines an outside diameter and an inside diameter, and wherein a portion defining an outside diameter is formed on the shaft, such that the outside diameter of the portion is smaller than the outside diameter of the bearing and larger than the inside diameter of the bearing.

5,066,193

WATER PUMP HOUSING CLOSURE AND A WATER PUMP GASKET ADJUSTMENT MECHANISM

Mariano Travanti Corinti, and Giovanni Nepi Campitelli, both of Caracas, Venezuela, assignors to Bombas Auriferas & Equipos Mineros B.A.E M., C.A., Caracas, Venezuela

Filed Apr. 24, 1990, Ser. No. 514,680
Int. Cl.[5] F01D *1/00, 25/00*
U.S. Cl. 415—201 **4 Claims**



1. A water pump housing closure which consists of a housing having housing edges on lateral sides thereof, L shaped projections fixed to the housing, two suction and support covers which can be joined on both lateral sides of said housing said covers having bevelled edges to coincide with the housing edges joined hermetically by the pressure exerted by pins inserted in a radial direction through the L shaped projections which are fixed to the housing, said projections having openings for the insertion of said pins.

5,066,194

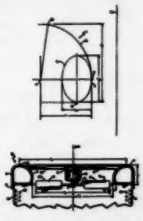
FAN ORIFICE STRUCTURE AND COVER FOR OUTSIDE ENCLOSURE OF AN AIR CONDITIONING SYSTEM

Yehia M. Amr, Manlius, N.Y.; W. Joseph Fallows, III, Windsor, Mass., and Mark R. Hogan, Manlius, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 11, 1991, Ser. No. 653,378
Int. Cl.[5] F01D *9/04*
U.S. Cl. 415—223 **12 Claims**

1. An orifice structure, for use with an axial flow fan having an axis of rotation, comprising a wall having
a circular wall leading edge,
a circular throat,
an inlet portion extending from said wall leading edge to said throat,
a wall trailing edge downstream with respect to said axial flow from said throat and
a discharge portion extending from said throat to said wall trailing edge,
said inlet portion comprising a surface produced by rotating a planar line about a coplanar axis of generation coincident with said axis of rotation, said line being a generally quarter segment of an ellipsoid having a major axis substantially parallel to said axis of generation.

2. A fan and fan orifice assembly comprising:
a fan of the axial flow type having
an axis of rotation,
a plurality of blades extending radially from an axis of rotation, each of said blades having a blade leading edge, a blade trailing edge and a tip,
a swept diameter, said swept diameter being the diameter of the circle described when that point on a blade tip that is farthest from said axis of rotation rotates about said axis of rotation, and
a blade axial depth, said blade axial depth being the normal distance between a first plane normal to said axis of rotation passing through a point on said blade leading edge that is four tenths (0.4) of said swept diameter from said axis of rotation and a second plane normal to said axis of rotation passing through a point on said blade trailing edge that is four tenths (0.4) of said swept diameter from said axis of rotation; and



an orifice structure comprising a wall having
a circular wall leading edge,
a circular throat,
an inlet portion extending from said wall leading edge to said throat,
a wall trailing edge downstream with respect to said axial flow from said throat,
a discharge portion extending from said throat to said wall trailing edge and
an axial distance from said wall leading edge to said wall trailing edge,
said inlet portion comprising a surface produced by rotating a planar line about a coplanar axis of generation coincident with said axis of rotation, said line being a generally quarter segment of an ellipsoid having
a minor axis that is between forty and seventy five thousandths (0.04 and 0.075) of said swept diameter and
a major axis that is substantially parallel to said axis of generation and two and one half ($1 < A_m \leqq 2.5$) times said minor axis,
said axial distance being one half ($\frac{1}{2}$) said blade axial depth plus six to twenty hundredths (0.06 to 0.20) of said swept diameter.

5,066,195

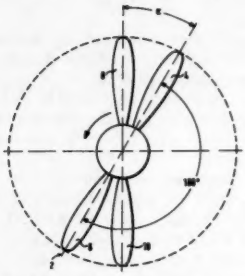
PROPELLER FOR AIRCRAFT OR THE LIKE

Werner M. Dobrzynski, Wolfenbüttel, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstault Für Luft- Und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 259,854, Oct. 19, 1988, abandoned. This application Jul. 10, 1990, Ser. No. 550,379
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736141
Int. Cl.[5] B64C *11/48*
U.S. Cl. 416—200 R **6 Claims**

1. A propeller having an even number of propeller blades, which are at least four in number, mounted for rotation about

a common axis and being intended for operation at speeds characterized by respective blade tip Mach numbers in the range of about 0.4 to 0.8, said blades being situated diametrically opposite one another in pairs, said blade pairs being arranged offset in relation to one another with a spacing angle



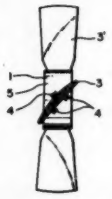
(ϵ) of between about 15° and 50° between them, and the magnitude of said spacing angle being inversely related to the magnitude of said blade tip Mach numbers, thereby to effect a reduction in the level of the rotational sound harmonics by interference.

5,066,196

ENGINE-COOLING FAN MADE OF SYNTHETIC RESIN

Kunitoshi Morofushi, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 184,257, Apr. 21, 1988, abandoned.
This application Jul. 14, 1989, Ser. No. 379,705
Int. Cl.[5] F01D *5/14*
U.S. Cl. 416—241 A **7 Claims**



1. In an engine-cooling fan made of a synthetic resin, said fan including a cylindrical hub, a plurality of fan blades provided integrally and radially on an outer peripheral wall of the hub and an integral member provided inside the hub for mounting the fan on a drive shaft extending at a right angle relative to a plane in which the fan blades lie, the improvement wherein at least two reinforcing ribs are integrally molded with the outer peripheral wall of the hub and a heel portion of each of the blades, one of said at least two reinforcing ribs being provided on a windway side of the corresponding blade, and the other one of said at least two reinforcing ribs being provided on a leeway side of the corresponding blade, and wherein an edge of each of said reinforcing ribs connected with the corresponding blade has a length not greater than one half of the radial length of the corresponding blade.

5,066,197

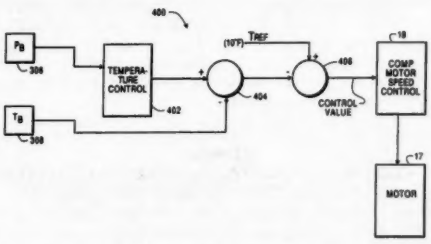
HYDRODYNAMIC BEARING PROTECTION SYSTEM AND METHOD

John M. Champagne, Seattle, Wash., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 10, 1990, Ser. No. 550,506
Int. Cl.[5] F04D *27/00*
U.S. Cl. 417—18 **25 Claims**

1. A protection system for a rotatable element which is rotatably supported by hydrodynamic bearings pressurized with a lubricating fluid provided from a pressure source with the fluid being subject to a change in state from liquid to vapor when heat from the bearings during rotation of the rotatable element is absorbed by the pressurized fluid during supporting of the rotatable element comprising:

a pressure sensor in fluid communication with fluid flowing from the hydrodynamic bearings for producing a pressure signal representative of pressure of the fluid flowing from the bearings;



a temperature sensor in fluid communication with fluid flowing from the hydrodynamic bearings for producing a temperature signal representative of temperature of the fluid flowing from the bearings;

a prime mover for driving the rotatable element with a variable rotational velocity; and

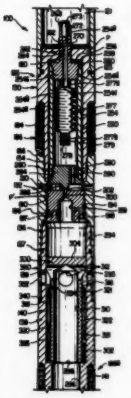
a controller, responsive to the pressure and temperature signals, for controlling the velocity of the prime mover as a function the pressure and temperature signals to prevent the change in state of the fluid flowing through the bearings from liquid to vapor.

5,066,198

GAS LIFT VALVE

Kenneth L. Decker, Garland, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 4, 1990, Ser. No. 533,019
Int. Cl.[5] F04F *1/18*
U.S. Cl. 417—54 **27 Claims**



1. A gas lift device for controlling the flow of gas between the exterior and the interior of a well tubing, comprising:

(a) body means, said body means having inlet means, an outlet, a flow course extending between said inlet means and said outlet, means on said body for attachment to means for securing the same to said well tubing;

(b) main valve means, including:

(i) a main valve member in said body slidable between an open position wherein flow is allowed to take place through said flow course and a closed position wherein such flow is prohibited,

(ii) means biasing said main valve member toward closed position, and

(iii) a pressure responsive area on said main valve member for moving said main valve member toward open position in response to pressure exterior of the tubing acting thereon;

(c) a main chamber in said body means for containing a volume of compressible liquid;

(d) pilot valve means in said body means between said main chamber and said main valve means, said pilot valve means including a variable volume chamber for containing a compressible liquid, a restricted fluid passage for fluidly communicating said variable volume chamber with said main chamber, and pressure responsive means for moving said pilot valve means from a closed position to an open position responsive to a differential pressure across said pressure responsive means as a result of an increase in pressure exterior of said well tubing for controlling admission of fluid pressure from said exterior of said tubing to said pressure responsive area of said main valve member for moving the same to open position; and

(e) means for sealing between said main valve and said body.

5,066,199

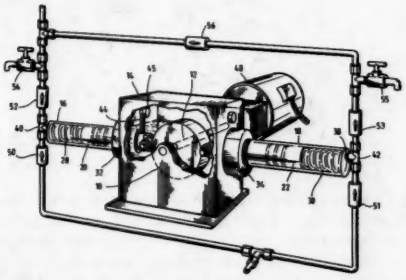
METHOD FOR INJECTING TREATMENT CHEMICALS USING A CONSTANT FLOW POSITIVE DISPLACEMENT PUMPING APPARATUS

D. Dwaine Reese, Richmond; Roy D. Sawyer, and Stanley G. Crow, both of Livingston, all of Tex., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Oct. 23, 1989, Ser. No. 425,566

Int. Cl.[5] F04B *1/02*

U.S. Cl. 417—63 **12 Claims**



1. A pumping apparatus for delivering a constant flow of liquid, the apparatus comprising:

a) one or more pairs of piston/cylinder combinations, each of the combinations comprising a piston and a cylinder, wherein each of the pistons is displaced into and out of the corresponding cylinder such that liquid is drawn into the cylinder when the piston is displaced out of the cylinder, and liquid is discharged from the cylinder when the piston is displaced into the cylinder at a rate proportional to the rate of displacement of the piston into the cylinder; and

b) a rotatable cam, the cam comprising;

a surface which contacts an end of each of said pistons so that the piston is displaced into and out of the corresponding cylinder when the cam rotates, the pistons in each pair of piston/cylinder combinations contact the cam surface at points which are 180 degrees out-of-phase from each other; and

a center of rotation, wherein the distance between the cam surface and the cam center varies as a function of the angle as the cam is rotated, and the distance between the cam surface and the cam center has a minimum value at an angle of 0 degrees and a maximum value at an angle of about 220 degrees,

wherein the distance between the cam surface and cam center increases at a first constant rate from an angle of 0 degrees to about 40 degrees,

wherein the distance between the cam surface and cam center increases at a second constant rate from an angle of about 40 degrees to about 180 degrees, said second constant rate being twice the first constant rate,

wherein the distance between the cam surface and cam center increases at the first constant rate from an angle of about 180 to an angle of about 220 degrees,

wherein the distance between the cam surface and cam center decreases from an angle of about 220 degrees to an angle of about 360 degrees.

5,066,200

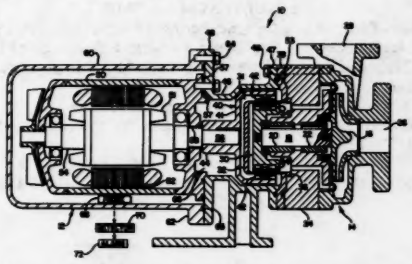
DOUBLE CONTAINMENT PUMPING SYSTEM FOR PUMPING HAZARDOUS MATERIALS

Kazuo Ooka, Morton Grove Village, Ill., assignor to Ansimag, Inc., Elk Grove Village, Ill.

Filed May 17, 1990, Ser. No. 525,125

Int. Cl.[5] F04B *49/02*

U.S. Cl. 417—63 **8 Claims**



1. A containment system for a motor-driven pump assembly having rotary pump means including a pump housing, a pump drive shaft, inlet and outlet port means, rotary motor means including motor housing means having a motor drive shaft end extending through a face of said motor housing means, and coupling means for coupling said motor drive shaft to said pump drive shaft, said containment system comprising:

first shroud means extending between said motor housing means face and said pump housing and sealingly affixed to said motor housing means face and said pump housing to enclose said motor drive shaft end and said coupling means;

sealed reservoir means for storing fluid; and

passage means communicating between the interior of said first shroud means and the interior of said reservoir means for permitting the flow of fluids escaping past said sealing wall means to be stored in said reservoir means.

5,066,201

DRIVING LOAD CONTROLLER FOR VARIABLE DISPLACEMENT TYPE HYDRAULIC PUMP

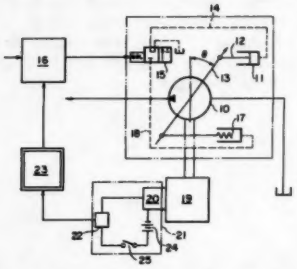
Katsumi Nagai; Teruyuki Nishimyou, both of Kariya; Masataka Osawa, Nagoya, and Hitoshi Ban, Oobu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of, Japan

Filed Aug. 9, 1990, Ser. No. 565,052

Claims priority, application Japan, Aug. 17, 1989, 1-210668

Int. Cl.[5] F04B *49/02*

U.S. Cl. 417—222 R 10 Claims



1. A driving load controller for a variable displacement type hydraulic pump comprising a relay connected in series with a starter motor for detecting that a drive source for driving said variable displacement type hydraulic pump is in a starting state, a controller for outputting a signal for minimizing the driving load of said hydraulic pump when said controller determines that said drive source is in the starting state in response to a signal from said relay switch, and driving load varying means for minimizing the driving load of said hydraulic pump by a signal from said controller.

5,066,202

METHOD AND APPARATUS FOR DELIVERING OIL TO A MULTI-STAGE PUMP

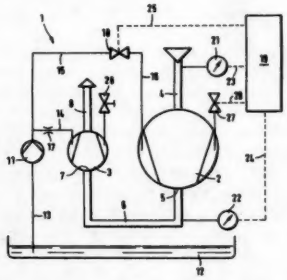
Hanns-Peter Berges, Cologne; Berthold Fischer, Erfstadt; Peter Mueller, Cologne, and Dieter Vorberg, Erfstadt, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 5, 1990, Ser. No. 533,535

Claims priority, application European Pat. Off., Jun. 6, 1989, 89110196.6

Int. Cl.[5] F04C *39/04;* F01C *21/04*

U.S. Cl. 417—228 9 Claims



1. A method of delivering oil into a pump chamber of a high-vacuum stage of a multi-stage pump, said method comprising the following steps:

sensing a first pressure at an intake region of said high-vacuum stage of said pump;

sensing a second pressure at a discharge region of said high vacuum stage of said pump;

sensing a pressure difference between said first and second pressures;

delivering oil to said high-vacuum stage of said pump in response to said pressure different; and

delivering increased quantities of oil to said high-vacuum stage of said pump when said pressure difference exceeds a predetermined value;

wherein said predetermined value is in a range of approximately 10 to 30 mbar.

5,066,203

APPARATUS FOR PNEUMATICALLY DISCHARGING CONCRETE

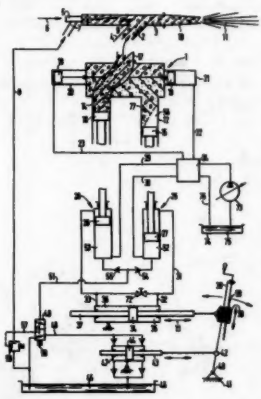
Joachim Coja, Gelsenkirchen-Buer; Karl-Ernst von Eckardstein, Unna, and Andre J. Simnovec, Recklinghausen, all of Fed. Rep. of Germany, assignors to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Continuation of Ser. No. 423,109, Oct. 18, 1989, abandoned. This application Jan. 18, 1991, Ser. No. 644,478

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835373; Aug. 18, 1989, 3927332

Int. Cl.[5] F04B *9/10, 35/02;* G05D *11/00*

U.S. Cl. 417—318 8 Claims



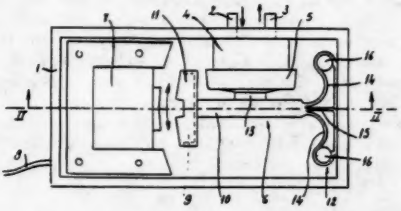
1. An apparatus for pneumatically discharging concrete fed hydromechanically in a dense stream, using for the hydromechanical feed a concrete pump having a hydraulic drive comprising at least two cylinders with opposed reciprocating pistons, the reciprocating pistons being driven by a hydraulic working medium and the opposed pistons having synchronization control by a displacer circuit between the two cylinders, the displacer circuit reciprocally conducting the working medium displaced by an advancing piston of one cylinder and discharging the working medium to the other cylinder, and having a dosing means for an additive serving as an accelerating agent, the dosing means being operated in association with the hydraulic drive of the concrete pump, characterized in that the dosing means is operated by a reciprocating piston drive (34) connected to the displacer circuit to provide hydraulic working medium from the concrete pump to reciprocally operate the piston drive, wherein the volume of working medium absorbed by the reciprocating piston drive in both directions corresponds to the amount of hydraulic working medium displaced from one cylinder by the advancing piston, the absorbed amount being added in both directions to the other cylinder.

5,066,204

DIAPHRAGM PUMP

Jacques Point, Annecy, and Pierre Joulia, Saint Jorioz, both of France, assignors to Rena S.A., Meythet, France

Filed Jul. 2, 1990, Ser. No. 546,315
Claims priority, application France, Jul. 7, 1989, 89 09902
Int. Cl.[5] F04B 17/00; H02K 33/00
U.S. Cl. 417—413 4 Claims



1. In a diaphragm pump for pumping gases or highly volatile liquids, comprising a vibrating arm acting on a diaphragm which serves for the suction and lift of the fluid to be pumped and placed into oscillation by a fixed electromagnet, one end of the vibrating arm being connected to pump housing and the other end holding at least one permanent magnet located opposite the electromagnet, the improvement wherein

said vibrating arm is composed of a single piece o plastic material with an enlarged head molded to said at least one permanent magnet, and having a part of said arm opposite said head attaching said arm within said housing; and

wherein said part attaching said vibrating arm within said housing comprises two symmetrical loops made of thin elastically-deformable sheets of plastic material and attached to attaching elements that are part of said housing, said sheets comprising spring means.

5,066,205

SCREW ROTOR LOBE PROFILE FOR SIMPLIFIED SCREW ROTOR MACHINE CAPACITY CONTROL

Robert A. Ingalls, Springfield, Vt., assignor to Excet Corporation, Springfield, Vt.

Division of Ser. No. 354,526, May 19, 1989, Pat. No. 4,938,672.
This application Apr. 12, 1990, Ser. No. 507,813
Int. Cl.[5] F04C 18/16
U.S. Cl. 418—1 3 Claims

1. A method of making different capacity helical screw rotor machines for the compression or expansion of an elastic working fluid comprising:

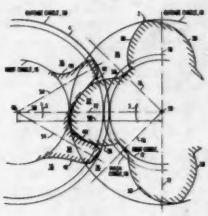
an elongated form male rotor rotatable about the central longitudinal axis and having an outside diameter, a root diameter, a pitch diameter and a length to diameter ratio with said pitch circle centered on said axis;

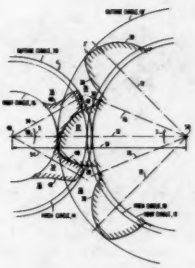
a plurality of elongated helical lobes extending longitudinally of said male rotor and circumferentially spaced about said pitch circle so as to provide intervening grooves therebetween, said screw rotor machine further comprising an elongated female formed rotor, rotatable about a central longitudinal axis and having an outside diameter, a root diameter, a pitch diameter and a length to diameter ratio with a pitch circle centered on said axis;

a plurality of elongated helical lobes extending longitudinally of said female rotor, and circumferentially spaced about said pitch circle so as to provide intervening grooves therebetween; and

wherein said lobes of said female rotor engage grooves of said male rotor such that a working fluid captured between intermeshed helical screw rotors is compressed or expanded during relative rotation of said rotors, said method of capacity control comprising:

maintaining constant for one of said rotors, the number of rotor lobes, the outside diameter, the root diameter pitch diameter and length to diameter ratio, and the basic proportion of said lobes, while varying, for the other rotor, the outside diameter, root diameter, pitch diameter, and the number of rotor lobes while maintaining the basic lobe





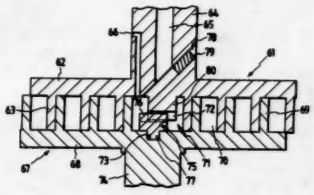
proportions the same, such that for the same speed of rotation of said other rotor, the compression or expansion capacity of said helical screw rotor machine is significantly varied.

5,066,206

FLUID SCROLL MACHINE WITH TORQUE TRANSMITTING COUPLING BETWEEN SCROLLS

Masayuki Kakuda; Shin Sekiya, and Yoshihisa Kitora, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

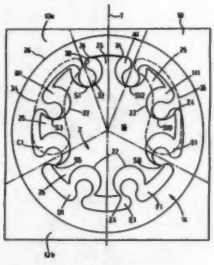
Filed Mar. 16, 1990, Ser. No. 494,344
Claims priority, application Japan, May 11, 1989, 1-117923
Int. Cl.[5] F01C 1/04, 17/06; F16D 3/04
U.S. Cl. 418—55.3 1 Claim



1. A fluid scroll machine including two scrolls eccentrically combined with each other and defining a hermetically closed space which moves as said scrolls are rotated synchronously with each other, said scrolls including vortical portions, wherein the central parts of the vortical portions of said scrolls

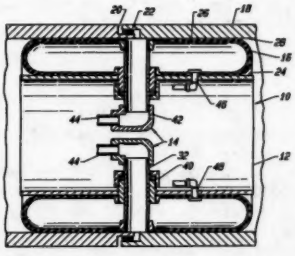
are notched so that an opening is provided between said scrolls; a coupling means for transmitting the torque of one of said scrolls to the other is provided in said opening, wherein each of said scrolls includes a base plate, the base plates of the scrolls having grooves which extend perpendicularly to each other and which are open to said opening, and wherein said coupling means comprises a body having key-like projections provided on a top and bottom thereof, said key-like projections being fitted in said grooves, respectively, and further wherein said coupling means is cylindrical shaped and has a diameter which is smaller than that of a driving shaft for driving one of said scrolls.

5,066,207
ROTARY DEVICE
William K. Valavaara, R.R. #1, Chesley, Ontario, Canada
Filed May 8, 1990, Ser. No. 520,796
Int. Cl.[5] F04C *2/063*
U.S. Cl. 418—171 **5 Claims**



1. A rotary device comprising:
an outer rotor defining a first axis of rotation, and bearing means therefor whereby same may rotate and having an annular outer wall, defining an internal cavity;
an inner rotor mounted within said cavity and bearing means therefor whereby same may rotate in the same direction as said outer rotor, said inner rotor defining a second axis of rotation, said second axis being offset with respect to said first axis whereby to define a spacing between said rotors varying from a minimum to a maximum at respective positions on opposite sides of said inner rotor, said positions defining a transverse axis between said positions, said axis defining an inlet side of said rotors on one side of said axis and an outlet side of said rotors on the other side of said axis;
wall means at least partly enclosing said rotors, said enclosure means defining inlet port means on said inlet side and outlet port means on said outlet side whereby fluid is prevented from entering or exiting said cavity except through said port means, said wall means including a larger wall portion located around said point of maximum spacing between said inlet port means and said outlet port means, and a smaller wall portion located around said position of minimum spacing between said outlet port means and said inlet port means;
a pre-determined number of contact bodies on said outer rotor of semi-cylindrical cross-sectional shape each said body defining a cylindrical arc of at least 270 degrees, in profile;
an abutment arm member extending between each said contact body, and said cylindrical wall of said outer rotor, each said abutment member defining a narrow neck extending between its respective contact body and said outer rotor, said outer wall between said abutments defining arcuate inwardly directed wall surfaces having a predetermined first radius;
a predetermined number of recesses in said inner rotor equal to said number of contact bodies of semi-cylindrical cross-sectional shape each said recess defining a semi-cylindrical arc greater than 180 degrees and receiving respective contact bodies, each said contact body forming a wiping seal with the cylindrical surface of its respective said recess over certain pre-determined angular regions during rotation;
partition members on said inner rotor extending radially outwardly between said recesses, having free ends defining outwardly directed arcuate surfaces of a predetermined second radius less than said first radius, and,
wherein upon rotation of the two rotors together in unison any one contact body may move inwardly and outwardly within its respective recess as said spacing between said rotors varies and will slide around the cylindrical surface of said recess thereby effecting a seal between said recess and said contact body which seal is maintained over an angular region within said first enclosure portion, and at least one seal is maintained between a said contact body and said outer wall over a lesser angular region within said first enclosure portion.

5,066,208
PIPE JOINT TESTING AND GROUTING UNIT
Gerard G. Warmerdam, 17400 N. Bowser Rd., Lodi, Calif. 95240
Filed Apr. 5, 1990, Ser. No. 505,702
Int. Cl.[5] F16L *55/162*
U.S. Cl. 425—13 **6 Claims**



1. A pipe joint pressurizing unit comprising:
a) a rigid cylindrical core member, having an inside surface and an outside surface;
b) an expandable sleeve mounted on the outside surface of the core member, the expandable sleeve having an outer surface that is displaceable from the outside surface of the core member;
c) means for expanding the expandable sleeve from the surface of the core member, and;
d) a telescoping pipe component providing a flow-through passage from the inside of the core member to the outside of the expandable sleeve, the telescoping pipe component including a rigid guide tube on the core member and a rigid outlet pipe slidably installed through the guide tube, the outlet pipe having a distal end connected to the expandable sleeve and an opposite end located inside the core member, and the guide tube having sealing means with a deformable sealing element for sealing between the guide tube and outlet pipe and permitting the outlet pipe to slide in the guide tube on expansion of the sleeve, the outlet pipe slidably engaging the deformable sealing element of the sealing means on displacement of the pipe in the guide tube on expansion of the sleeve while maintaining a seal between the guide tube and outlet pipe.

5,066,209

VENTED TIRE MOLD

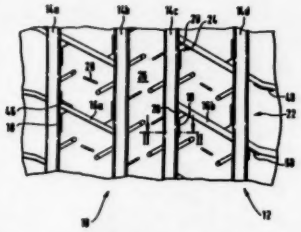
Gerhard Schmaderer, Cham, and Rainer Hilke, Berg, both of Fed. Rep. of Germany, assignors to A-Z Formen-und Maschinenbau GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 27, 1990, Ser. No. 516,075

Claims priority, application Fed. Rep. of Germany, May 2, 1989, 3914649

Int. Cl.[5] B29C *35/02*

U.S. Cl. 425—28.1 15 Claims



1. In a vented tire mold that includes a surface that forms the tread surface of a tire and is provided on a segment member and has integrally formed thereon projecting ribs to form a corresponding profiling in said tread surface of said tire, whereby said ribs have side surfaces that extend essentially perpendicular or at an angle to said surface of said segment member, the improvement wherein:

at least one venting gap having specific dimensions is formed in said segment member and extends in its longitudinal direction along a line of intersection between one of said side surfaces of said ribs and said surface of said segment member and has a dimension of depth in a radially outward direction of said mold.

5,066,210

APPARATUS FOR COOLING AND GRANULATING EXTRUSIONS OF THERMOPLASTIC MATERIAL

Friedrich Hunke, Grossostheim, Fed. Rep. of Germany, assignor to Automatik Apparate-Maschinenbau GmbH, Grosbostheim, Fed. Rep. of Germany

PCT No. PCT/EP88/00802, § 371 Date Apr. 26, 1989, § 102(e) Date Apr. 26, 1989, PCT Pub. No. WO89/01858, PCT Pub. Date Mar. 9, 1989

PCT Filed Sep. 2, 1988, Ser. No. 350,529

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729686

Int. Cl.[5] B29C *47/78*

U.S. Cl. 425—71 5 Claims

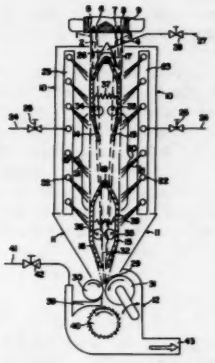
1. Apparatus for cooling and granulating extrusions of thermoplastic material issuing from extrusion dies comprising:

a pair of substantially mirror image symmetric channels arranged back to back disposed between a plurality of extrusion dies and a granulator having draw-in rollers, a cutting wheel and an entrance disposed below said extrusion dies;

each channel having an upper end exposed to a cooling water supply and a lower end directed toward said granulator entrance, each channel extending laterally beyond an imaginary straight line projected from said dies to said granulator entrance;

a plurality of spray nozzles disposed along each of said channels for cooling said channels;

said channels each being formed by a first pair of laterally spaced guide plates and a second pair of laterally spaced guide plates, said pairs of guide plates being disposed one above the other and arranged to provide a descent space therebetween to provide cooling on all sides of an extrusion directed along a said channel as it passes along said space and said guide plates of each said first and second pair of guide plates being laterally separable from one another whereby with increasing separation each said channel increases in lateral distance beyond the imaginary straight line between the dies and said granulator entrance



to provide increased tension in an extrusion directed along a said channel from said extrusion dies to said granulator entrance.

5,066,211

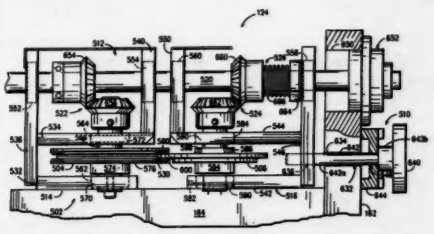
MATERIAL FEED CONTROL ASSEMBLY IN A ROTARY PRESS

William G. Wunder, Sr., Hamilton, Mich., and Eric M. Bliss, Lexington, N.C., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 1, 1990, Ser. No. 487,486

Int. Cl.[5] B30B *11/08, 15/30;* B29C *43/34*

U.S. Cl. 425—122 13 Claims



1. A control assembly to control the rate at which a food material is conducted to die cavities of a rotary press including a die plate forming a multitude of the die cavities, and means to force the food material into the die cavities, to mold the food material therein into tablets and then to eject the tablets from the die cavities, the control assembly comprising:

a roller support assembly;

a first roller rotatably supported by the roller support assembly;

a second roller rotatably supported by the roller support assembly and located adjacent the first roller, wherein the first and second rollers form a feed gap therebetween to receive the food material, and wherein the second roller is also supported for movement toward and away from the first roller;

adjusting means connected to the roller support assembly to move the second roller toward and away from the first roller to vary the size of the feed gap;

roller drive means connected to the first and second rollers to rotate said rollers to pull the food material through the

feed gap and to direct the food material to the die plate, and including

i) a roller drive shaft,

ii) a first gear connected to the first roller to rotate the first roller,

iii) a second gear mounted on the drive shaft for rotation therewith and drivingly engaging the first gear to rotate said first gear,

iv) a third gear connected to the second roller to rotate the second roller, and for movement therewith toward and away from the first roller,

v) a fourth gear mounted on the drive shaft for rotation therewith and for sliding movement therealong, and drivingly engaging the third gear to rotate the third gear, and

vi) biasing means engaging the fourth gear and urging the fourth gear toward the third gear to maintain the fourth and third gears in driving engagement as the second roller moves toward and away from the first roller.

5,066,212

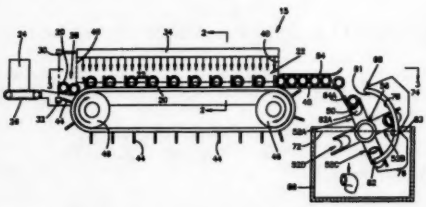
APPARATUS FOR BENDING PIPE

Thomas F. Moran, Jr., Chagrin Falls, Ohio, assignor to Midwest Plastic Fabricators, Chagrin Falls, Ohio

Filed Mar. 21, 1990, Ser. No. 496,859

Int. Cl.[5] B29C *53/08, 53/84*

U.S. Cl. 425—145 **24 Claims**



11. An apparatus for bending lengths of pipe into elbows comprising:

a first camming surface, said first camming surface including a first distal portion and a first proximal portion;

a second camming surface, said second camming surface including a second distal portion and a second proximal portion;

a plurality of arcuate dies each defining a bending surface having a center portion and opposed end portions against which a length of pipe is formed, each of said arcuate dies being relatively U-shaped in transverse cross section and being adapted for receiving the center portion of one of the lengths of pipe;

means for moving each of said arcuate dies between a first position and a second position relative to said first and second camming surfaces, said first and second distal portions being spaced farther from the bending surface of each of said arcuate dies at said first position than said first and second proximal portions are spaced from the bending surface of each of said arcuate dies at said second position, each of said arcuate dies gradually approaching said first and second camming surfaces as each of said arcuate dies moves along a line of travel from said first position to said second position so that one end portion of each length of pipe held in each of said arcuate dies engages said first camming surface and the other end portion of each length of pipe engages said second camming surface, said first and second camming surfaces thereby urging the end portions of each length of pipe toward said arcuate dies until each length of pipe is substantially formed against one of said bending surfaces;

means for heating the center portion of the lengths of pipe before they are disposed on said arcuate dies; and

means for transporting the lengths of pipe through said heating means.

5,066,213

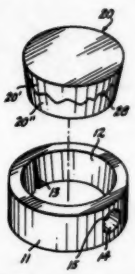
WAX-CASTING COMPONENTS

John Ferincz, 8920 202nd Pl. Southwest, Edmonds, Wash. 98020

Continuation-in-part of Ser. No. 331,830, Apr. 3, 1989, abandoned. This application Mar. 28, 1990, Ser. No. 501,070

Int. Cl.[5] B22C *7/02*

U.S. Cl. 425—175 **6 Claims**



1. A combination of wax-casting components for forming and retaining a mold of resilient material which mold is used for manufacture of wax models by pressure injection of wax into the mold, said combination comprising a mold-forming member having an open top, a closed bottom and a continuous circumferential wall, said wall of said member having an inner periphery which, in combination with said top and said bottom of said member, defines an interior cavity tapering in cross-sectional size from said top to said bottom, and a mold-retaining ring having an open top, and open bottom and a continuous circumferential wall defining an interior cavity of the same cross-sectional shape as the cross-sectional shape of said interior cavity of said mold-forming member, said interior cavity of said ring being tapered in cross-sectional size from top to bottom to the same degree as said cavity of said mold-forming member, the cross-sectional size of said interior cavity of said mold-retaining ring at the bottom of said ring cavity being smaller than the cross-sectional size of said interior cavity of said mold-forming member at the bottom of said cavity of said member, said wall of said mold-forming member having a sprue-positioning bore therein and said wall of said mold-retaining ring having a wax injection hole therein.

5,066,214

INJECTION MOLDING APPARATUS

Indra R. Baxi, Troy, and Erik E. Erikson, Grosse Pointe Shores, both of Mich., assignors to Encore Molding Systems, Inc., Mt. Clemens, Mich.

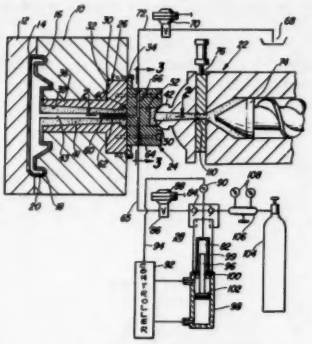
Filed Nov. 2, 1988, Ser. No. 266,477

Int. Cl.[5] B29C *45/20, 45/34;* **B29D** *22/00*

U.S. Cl. 425—190 **9 Claims**

1. In a gas assisted plastic molding apparatus having a mold, sprue means carried by said mold and having a sprue bushing defining a sprue passage communicating with a molding cavity in said mold, a gas delivery system, and means for injecting a melt stream of molten plastic through said sprue means in a direction from said injection means toward said cavity, said plastic injection means having a nozzle, the improvement comprising gas injection means located between said nozzle and said sprue bushing when said plastic injection means is operatively associated with said mold, said gas injection means being adapted for connection to said gas delivery system, said gas injection means comprising an adapter having an end face abutting an end face of said sprue bushing, and being attached

thereto, said gas injection means further having a gas injection probe extending forwardly of said adapter and into said sprue



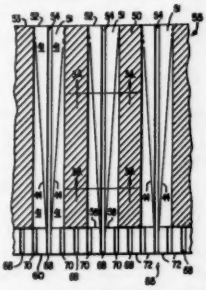
bushing at said sprue passage to inject gas into molten plastic passing through said sprue passage.

5,066,215

EXTRUSION DIE FOR FORMING THIN-WALLED HONEYCOMB STRUCTURES

Donald C. Peters, Savona, and Richard L. Seely, Horseheads, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Aug. 29, 1988, Ser. No. 237,983
Int. Cl.[5] B29C *47/30*
U.S. Cl. 425—464 **12 Claims**



1. An extrusion die for making a thin-walled honeycomb structure,

said die having an inlet portion, an outlet portion, and a junction between the inlet portion and the outlet portion;

the inlet portion having a plurality of feed holes longitudinally extending from an inlet face of said inlet portion to the junction at an outlet end of said inlet portion, at least some of the feed holes being uniformly tapered throughout their length and both diminishing in transverse cross sectional area and changing in transverse cross sectional shape along their length in a smooth and gradual transition from inlet ends of the holes at the inlet face of the inlet portion to outlet ends of the holes at the junction; and

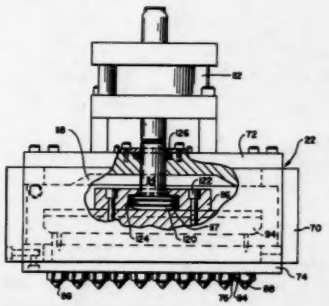
the outlet portion having a plurality of intersecting and laterally criss crossing discharge slots longitudinally extending from an inlet end of the outlet portion at the junction to an opposite outlet face of the outlet portion, said discharge slots defining a plurality of polygonal pins bordered by said discharge slots, the outlet ends of the holes opening into portions of the inlet ends of the slots at the junction, central portions of the outlet ends of the tapered feed holes being aligned at the junction with intersections of the slots at their inlet ends, whereby each tapered feed hole is adapted to directly feed a discharge slot intersection, and the transverse cross sectional area and shape of the outlet end of each tapered feed hole being the same as the transverse cross sectional area and shape of the portion of the inlet end of discharge slots into which that outlet end of a feed hole directly feeds at the junction, whereby material extruded through the discharge slots flows both laterally and toward the outlet ends of the discharge slots to form a honeycomb structure.

5,066,216

APPARATUS FOR INJECTION OF VISCOUS MATERIAL

Robert M. Kowtko, Long Valley, N.J., and Richard A. Mellwig, Tatamy, Pa., assignors to Binney & Smith Inc., Easton, Pa.

Filed Sep. 22, 1989, Ser. No. 410,937
Int. Cl.[5] B29C *45/23*
U.S. Cl. 425—562 **7 Claims**



1. An apparatus for injecting viscous material comprising a vertically adjustable manifold, said manifold having a top, a bottom and perimeter side walls to define a hollow cavity for receiving viscous material for subsequent injection into a container, means for supplying pressurized viscous material to said cavity, a plurality of injection orifices disposed in said manifold bottom, a vertically reciprocating platen disposed within said cavity and having a plurality of orifice pins corresponding to the number of injection orifices and positioned relative to said injection orifices such that when said platen is in a lowered position said orifice pins are seated within and block said orifices and when said platen is in a raised position said orifice pins are removed from said injection orifices and said injection orifices are open.

5,066,217

CLAMPING APPARATUS FOR AN INJECTION MOLDING MACHINE

Shigeo Fukuzawa; Takahide Kaneko, and Masaaki Fujimura, all of Yamaguchi, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 8, 1990, Ser. No. 564,188
Int. Cl.[5] B29C *45/66*
U.S. Cl. 425—589 **6 Claims**

1. A clamping apparatus comprising:

a machine base,

a fixed platen fixedly mounted on the machine base and having a plurality of clamping cylinders and a fixed mold, each clamping cylinder defining a cylinder bore therein,

a movable platen having a movable mold, said movable platen being installed on the machine base to move relative to the fixed platen,

a plurality of tie bars extending through the movable platen, each tie bar having grooves therearound at a substantially longitudinal center portion thereof,

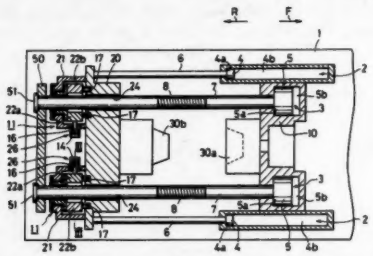
a plurality of pistons slidably situated inside the cylinder bores of the clamping cylinders, each piston being connected to one end of each tie bar,

means for moving the movable platen to and from the fixed platen,

a plurality of two-part nuts mounted on the movable platen to be engageable with the grooves of the tie bars, said two-part nuts being movable to and from the respective tie bars and along the tie bars,

means for moving the two-part nuts to and from the tie bars, and

means for moving the two-part nuts along the tie bars, said means including nut boxes fixed to the movable platen and housing the two-part nuts, said nut boxes having threaded



holes through which the tie bars extend; adjusting shafts situated inside the respective nut boxes, each adjusting shaft engaging with said threaded hole and having a through hole through which the tie bar extends and a flange with which the two-part nuts slidably contact; and pressing means disposed in the movable platen for pressing the two-part nuts toward the flanges; said two-art nuts being moved along the tie bars by rotating the adjusting shafts and positioned on the tie bars so as to mesh with the grooves of the tie bars when the movable mold is brought into contact with the fixed mold.

5,066,218

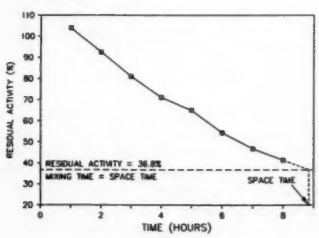
COMPOSITION OF A STEEPED STARCHED-CONTAINING GRAIN AND A CELLULASE ENZYME

Scott C. Silver, Belmont, Calif., assignor to Genencor International, Inc.

Continuation of Ser. No. 248,001, Sep. 22, 1988, abandoned, which is a division of Ser. No. 49,750, May 13, 1987, abandoned. This application Mar. 22, 1991, Ser. No. 675,013

Int. Cl.[5] A21D *2/00, 8/02*

U.S. Cl. 426—20 **1 Claim**



1. A composition consisting essentially of a steeped starch-containing grain and a cellulase enzyme in a concentration from at least about 5000 F.P.U./ton of steeped grain to about 60,000 F.P.U./ton of steeped grain.

5,066,219

METHOD AND APPARATUS FOR BURNING LIQUID FUEL

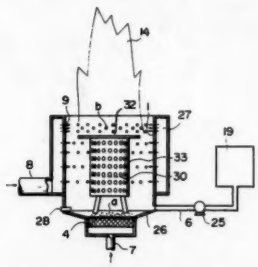
Norio Anzawa; Koji Adachi; Tetsuo Futakawa; Hironari Sato, and Akira Narita, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,782

Claims priority, application Japan, Mar. 31, 1989, 1-81237; Mar. 31, 1989, 1-81238

Int. Cl.[5] F23M *3/04*

U.S. Cl. 431—10 **3 Claims**



1. A method of burning a liquid fuel in an apparatus for burning liquid fuel which has a combustion chamber and a liquid fuel foamer having a top and a bottom in the bottom of the combustion chamber having a porous element with only the top exposed to the interior of the combustion chamber, the method comprising the steps of:

supplying a shallow layer of liquid fuel onto the top of the porous element;

supplying air for foaming to the bottom of the porous element from beneath the porous element in an amount to cause substantially all the liquid fuel to be immediately converted into foam at a foaming expansion ratio of 5–50 times;

causing the resulting foam to enter the combustion chamber; and

supplying combustion air separately from the foaming air and mixing it with the foam in the combustion chamber for burning the foam.

5,066,220

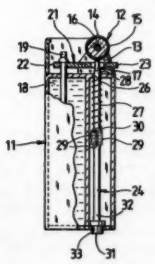
CIGARETTE LIGHTER

Henry L. Vick, 24-7 Westchester Ct., Birmingham, Ala. 35215

Filed May 7, 1990, Ser. No. 519,737

Int. Cl.[5] F23D *11/36*

U.S. Cl. 431—277 **22 Claims**



12. A cigarette lighter for creating a flame comprising:

(a) a casing;

(b) means mounted to said casing for selectively supplying a flammable gas;

(c) means mounted to said casing adjacent said gas supplying means for selectively creating a spark; and

(d) means mounted to said casing and said spark creating means for automatically deactivating said spark generating means.

5,066,221

FITTING FOR JOINING AT LEAST ONE HYBRID BURNER TO APPARATUS FOR SUPPLYING A FLUID FUEL

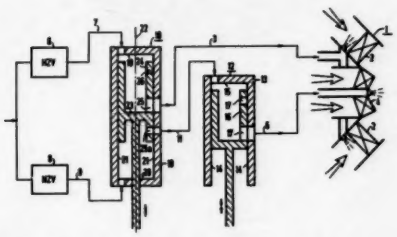
Bernard Becker, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 9, 1991, Ser. No. 639,600

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1990, 4000446

Int. Cl.[5] F23Q *9/08*

U.S. Cl. 431—280 27 Claims



1. In a burner and supply apparatus assembly including:

at least one hybrid burner having a main burner operable with premixing combustion and an auxiliary burner operable to furnish a pilot light for the main burner, a main supply apparatus, and an auxiliary supply apparatus,

a fitting for connecting the at least one hybrid burner to the main supply apparatus and the auxiliary supply apparatus, comprising:

a) a change-over element, a main feed line for communicating between said change-over element and the main supply apparatus, an auxiliary feed line for communicating between said change-over element and the auxiliary supply apparatus, a main tie line for communicating between said change-over element and the main burner, an auxiliary tie line for communicating between said change-over element and the auxiliary burner, said change-over element being operable in at least one first and at least one second switching state, in said at least one first switching state said main feed line communicating with said main tie line and said auxiliary feed line communicating with said auxiliary tie line, and in said at least one second switching state said main feed line communicating with said auxiliary tie line and said auxiliary feed line being blocked; and

b) a switchable throttle element being connected in series with said auxiliary tie line for conducting a fuel flow, said throttle element being operable in said at least one first switching state with relatively slight throttling action and in said at least one second switching state with relatively great throttling action.

5,066,222

METHOD AND APPARATUS FOR HEATING AND CONVEYING PLASTIC PREFORMS PRIOR TO MOLD BLOWING OPERATIONS

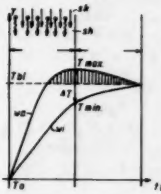
Uwe-Volker Roos, Bodenteich, and Franz Gittner, Soltendieck, both of Fed. Rep. of Germany, assignors to Bekum Maschinenfabriken GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 14, 1990, Ser. No. 493,343

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908219; Mar. 15, 1989, 3908345; Mar. 30, 1989, 3910293

Int. Cl.[5] F27D *5/00*

U.S. Cl. 432—5 3 Claims



1. A method for heating cold preform blanks produced by an injection method which are conveyed through heating and cooling sections and afterwards are introduced to a blow molding device for inflation of said preform blanks into hollow articles, comprising the steps of first heating said preform blanks to a temperature below their blow molding temperature, next cooling said preform blanks, then reheating said preform blanks to a temperature wherein the outer aspects of said preform blanks are slightly above their blow molding temperature, next allowing the temperatures between said preform blanks' outer and inner aspects substantially to equalize at said blow molding temperature, and introducing said preforms with their said outer and inner aspects equalized at said blow molding temperatures into a blow mold.

5,066,223

MELTING AND CASTING FURNACE

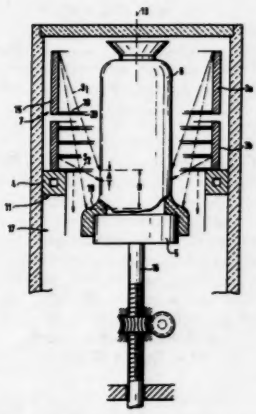
Johannes Mosch, Alzenau, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau I, Fed. Rep. of Germany

Filed Nov. 13, 1990, Ser. No. 612,629

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1990, 4022389

Int. Cl.[5] F27D *3/12;* F27B *17/00*

U.S. Cl. 432—184 9 Claims



1. Melting and casting furnace for the production of direc-

tionally solidified or monocrystalline structures, said furnace comprising

a housing having a bottom opening with a cooling ring disposed about the perimeter thereof,

a cooling table with a mold disposed thereon arranged for movement in and out of said housing through said bottom opening,

heating apparatus in said housing, said apparatus being arranged to heat said mold by radiation, and

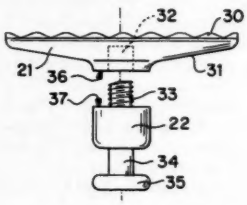
a plurality of radiation shields spaced one above the other in said housing, the lowermost said radiation shield lying above said cooling ring about said bottom opening and separating a heating zone inside said housing from a cooling zone outside said housing, said shields extending from said heating apparatus toward said mold so that radiation from the heating apparatus to the cooling zone is blocked.

5,066,224

ORTHODONTIC ANCHOR

Michael S. Block, Metairie, and David R. Hoffman, Mandeville, both of La., assignors to Oasis Implants Incorporated, Metairie, La.

Filed Feb. 25, 1991, Ser. No. 659,680
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—7 **4 Claims**



1. An orthodontic anchor system to cure malalignment of teeth which comprises in combination:

a. an onplant which is surgically placed in the subperiosteal tunnel of a patient;

b. said onplant having a onplant bone interface surface which is placed against the skeletal bone to permit biointegration;

c. an orthodontic abutment which is attached to said onplant after biointegration has occurred between the onplant and the skeletal bone;

d. an orthodontic device attached to two bands which are placed around two teeth and adapted to be attached to said onplant;

whereby said orthodontic anchor system hold said teeth stable and non-mobile, permitting the orthodontist to treat the malalignment of the teeth of the patient.

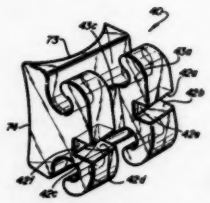
5,066,225

CRYSTALLINE ALUMINA ORTHODONTIC BRACKET

Robin M. Forbes Jones, Pennington; Carl Panzera, Bellemead, and Robert D. DeLuca, Pennington, all of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Continuation-in-part of Ser. No. 743,851, Jun. 12, 1985, Pat. No. 4,639,218, which is a continuation-in-part of Ser. No. 602,876, Apr. 23, 1984, abandoned, and Ser. No. 707,281, Mar. 6, 1985, abandoned. This application Nov. 19, 1986, Ser. No. 932,745
The portion of the term of this patent subsequent to Jan. 27, 2004, has been disclaimed.
Int. Cl.[5] A61C *7/00*
U.S. Cl. 433—8 **7 Claims**

1. An orthodontic bracket comprising a base member for attaching to a tooth and a body member extending from the base member, said body member including walls defining an archwire groove, wherein said walls comprise crystalline alumina and wherein said bracket has a probability of survival of



at least 98 per cent, by Weibull statistical analysis. when said walls are subjected to a torque force of 1000 gram-centimeters

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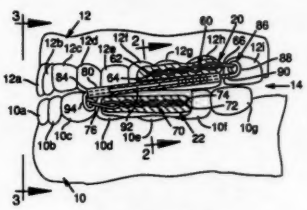
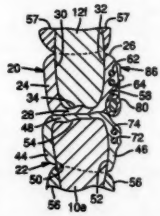
5,066,226

ORAL ORTHOPEDIC APPLIANCE FOR CORRECTING MANDIBULAR RETRUSION

John D. Summer, 427 NW. 23rd St., Portland, Oreg. 97210-2615

Continuation-in-part of Ser. No. 263,087, Oct. 27, 1988, Pat. No. 4,969,822. This application Nov. 13, 1990, Ser. No. 613,112
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—19 **6 Claims**





1. A telescopic, intraoral appliance for aligning the mandible and maxilla, comprising:

an upper attachment for attaching said appliance to said mandible and a lower attachment for attaching said appliance to said maxilla;

a sleeve having a first end and an open second end;

a first fastener coupled to the first end of the sleeve and coupled to one of said upper and lower attachments;

a rod attached at one end to the other of said upper and lower attachments and having its other end projecting through said open end for reciprocating telescopic movement within said sleeve; and

rod engagement means for restricting rotational movement of said rod relative to said sleeve.

5,066,227

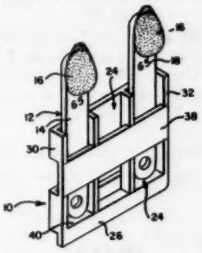
DENTAL TOOTH SHADE MATCHING SYSTEM

Bruno Pozzi, 425 Deseo Ave., Camarillo, Calif. 93010

Filed Apr. 17, 1991, Ser. No. 686,809
Int. Cl.[5] A61C *19/10*
U.S. Cl. 433—26 **4 Claims**

1. A system for use by a dentist in selecting a tooth color for a patient for whom artificial teeth are to be made, said system

comprising a holder and dual identical shade guides being identically shaded and removably supported in said holder, each of said dual shade guides including an elongated handle having a tooth sample supported on one end thereof and identical indicia, said shade guides being removable from said holder for one to be sent to the tooth manufacture for use as a guide in making teeth for said patient while the other of said shade guides may be retained by the dentist in said frame.

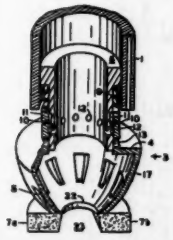


5,066,228

SALIVA EJECTOR

George J. Doundoulakis, 2498 Kayron La., North Bellmore, N.Y. 11710, and James H. Doundoulakis, 110-20 71st St., Forest Hills, N.Y. 11375

Filed Aug. 23, 1990, Ser. No. 571,182
Int. Cl.[5] A61C *17/06, 17/14*
U.S. Cl. 433—91 **6 Claims**



5. An improved saliva ejector tip for providing more efficient ejection of fluids and waste products from a patient's mouth during dental treatment with reduced likelihood aspirating soft tissue; such tip being connected to vacuum generating equipment and disposal plumbing via a flexible tube usually bent into a hook for support over a patient's lower lip, comprising:

a substantially cylindrical upper member serving as adaptor for rigidly joining said tip with the flexible tube;

a lower member providing side wall openings for allowing waste fluid and secretions from the patients mouth into said ejector tip, said lower member being movably supported onto said upper member;

spring means of a predetermined stiffness urging said lower member downwardly, away from said upper member; thereby said lower member is pushed away by said spring means when the pressure difference between inside and outside of said tip is small, and said lower member is being displaced by the action of outside atmospheric pressure upwardly, causing said spring to contract when the pressure difference increases as a consequence of excessive fluids and or soft tissue, intraorally filling the side wall openings;

a pin/slot combination between said upper and said lower member for allowing said lower member to axially slide with respect to said upper member, while preventing relative rotation between the two members;

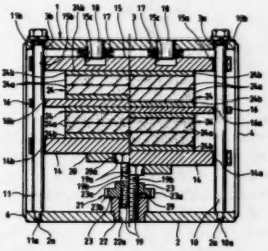
radially directed hole means on said upper and said lower member; wherein said hole means on the upper and lower members are not aligned and, therefore, do not conduct waste fluids when said lower member is at a lower position away from the flexible tube; but said hole means become aligned to conduct fluids as said lower member moves upwardly as a consequence of increased vacuum force when the side wall openings are being filled with fluid and or soft mouth tissue; thereby such additional conduction of fluids through said hole means as they become aligned, causes a drop in pressure difference and helps release of the soft tissue.

5,066,229

JIG FOR HOLDING DISC BRAKE PADS

Masaji Kitajima, Gumma, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1990, Ser. No. 515,755
Claims priority, application Japan, May 1, 1989, 1-50243[U]
Int. Cl.[5] F27B *3/06*
U.S. Cl. 432—160 **17 Claims**



1. A jig for holding a disc brake pads during curing thereof, the jig comprising:

a frame having a front plate and a rear plate;

a pair of hanger shafts extending between said front plate and said rear plate;

a front support plate and a rear support plate for supporting brake pads therebetween, the front support plate and the rear support plate being slidably disposed on said hanger shafts and being guided by said hanger shafts;

spring means between said rear plate and said rear support plate for urging the rear support plate toward the front plate; and

means mounted on said front support plate for driving said front support plate toward the rear support plate to apply a predetermined compression force to brake pads disposed therebetween, said driving means including a bolt connecting the front support plate to the front plate, and a gear rotatably supported by said front plate and having teeth on the outside circumferential surface thereof, said front support plate being pushed toward said rear plate by said bolt upon rotation of said gear.

5,066,230

DENTAL PRODUCT COMBINING A REAMER TOOL AND ANCHOR POST

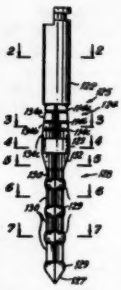
Bernard Weissman, 225 East 48th St., New York, N.Y. 10017

Continuation-in-part of Ser. No. 172,483, Mar. 24, 1988, Pat. No. 4,990,088. This application Nov. 18, 1988, Ser. No. 273,299
Int. Cl.[5] A61C *3/02, 5/04*
U.S. Cl. 433—165 **12 Claims**

1. A combination cutting tool and anchor device for attachment to a tooth, or the like, comprising:

a first holder end portion designed to be receivable in a dental tool holder such that the dental holder can rotate

the cutting tool; a second drilling end portion having a proximal end and a distal tip end relative to the holder end portion, the drilling end tapering longitudinally endwardly from a maximum diameter at the proximal end to a minimum effective diameter at the distal tip end, the drilling end portion having a polygonal cross-section which provides axially facing cutting edges for drilling a bore into a tooth of a patient upon rotation of the tool; a shank portion extending intermediate the two end portions and including a first and a second axially successive, longitudinally extending shank sections; the first such shank section having laterally facing cutting surfaces and a relatively larger effective diameter, the laterally facing cutting surfaces of the first shank section being defined by



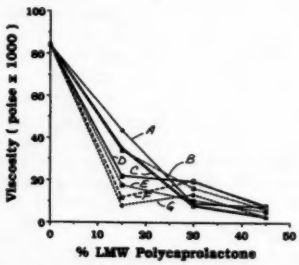
a substantially continuous curve, extending axially from the intersection with the second shank section; and the second shank section having a relatively smaller diameter relative to the first shank section and to the maximum diameter of the drilling end portion, such that upon the application of a laterally directed force while rotating the tool within a previously drilled bore, undercut portions are routed out from the interior surface of the bore, and a crown anchoring means portion located intermediate said holder end portion and the shank portion, for anchoring a dental prosthesis with respect to a tooth; the combination device being formed as a integral, rigid unit, but the crown anchoring means being formed of a softer, more easily shaped material than the shank.

5,066,231

DENTAL IMPRESSION PROCESS USING POLYCAPROLACTONE MOLDING COMPOSITION

Joel D. Oxman, Minneapolis, and F. Andrew Ubel, III, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 23, 1990, Ser. No. 484,692
Int. Cl.[5] A61C *9/00*
U.S. Cl. 433—214 **7 Claims**



1. A method for making an impression of dental tissue, comprising the step of enveloping the tissue with a molten or softened molding composition comprising a blend of high molecular weight and low molecular weight polycaprolactones.

5,066,232

METHOD OF REMOVING PULP WITH AN ALKALINE PRODUCT

Febo R. Negri, Milan, and Ercole Tomasini, Mirandola, both of Italy, assignors to Biomedic S.r.l., Milan, Italy

Filed Oct. 4, 1990, Ser. No. 592,947
Claims priority, application Italy, Oct. 4, 1989, 21917 A/89
Int. Cl.[5] A61C *5/02*
U.S. Cl. 433—224 **10 Claims**

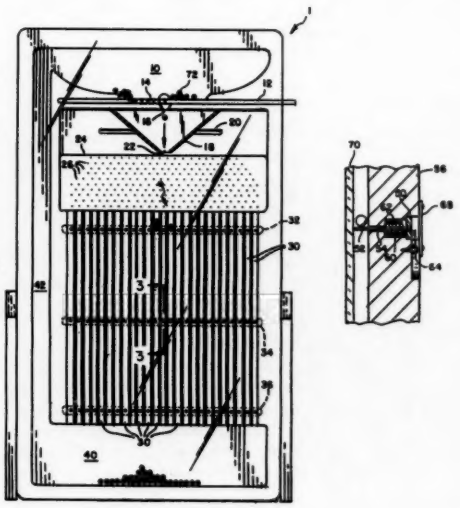
1. A method of treating pulp of a tooth root canal comprising the step of treating the tooth pulp with potassium hydroxide.

5,066,233

QUINCUNX WITH A REARWARDLY MOVABLE BALL-STOP

Aldo A. Laghi, P.O. Box 431, Clifton Park, N.Y. 12065

Filed Jun. 4, 1990, Ser. No. 532,441
Int. Cl.[5] G09B *1/00*
U.S. Cl. 434—188 **10 Claims**



1. A statistics training device comprising:
a support member;
a ball conduit means located on a top portion of said support member;
a pinplate means located on a front face of said support member below said ball conduit means;
a plurality of elongated groove means located on said support member below said pinplate means;
at least one ball-stop means located on said support member below at least a portion of said grooves, said ball-stop means comprising a plurality of pins mounted on a base member that can be moved in a manner which allows said pins to move from a first position wherein said pins at least partially block said groove means to a second position

wherein said pins are withdrawn from said groove means and are moved rearwardly toward a rear face of said support means; and

a ball reservoir located on said support member below said at least one ball-stop means; wherein said ball-stop means further comprises at least one spring which biases said base member in one direction.

5,066,234

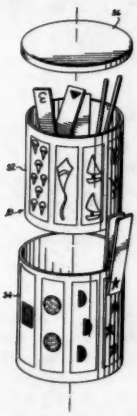
EDUCATIONAL TOY AND METHOD THEREFOR

Laura L. LeDesma, 648 W. Pantera, Mesa, Ariz. 85210

Filed Jun. 14, 1990, Ser. No. 537,823

Int. Cl.[5] G09B *1/00*

U.S. Cl. 434—205 **5 Claims**



1. An educational toy comprising:

a plurality of clips;

a first can having a cavity for storing the clips;

a larger second can having a cavity for storing the first can and having a cover;

each clip having a front board, a rear board, and a hinge connected to the front and rear boards;

the front board having respective numbers in a series disposed thereon;

the rear board having respective shapes with a selective color disposed thereon;

the first can having a plurality of first panels arranged in series disposed in a peripheral direction on the outer surface thereof;

the first panels having a series of different figures arranged in an increasing number of figures;

the second can having a plurality of second panels arranged in series and disposed in a peripheral direction on the outer surface thereof;

the second panels having a series of different geometrical shapes arranged in an increasing number of shapes; and

the shapes on each second panel having a selective color different from colors of the other second panels.

5,066,235

CONNECTOR ASSEMBLY FOR ELECTRONIC DEVICES

Fumiyuki Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 18, 1990, Ser. No. 554,276

Claims priority, application Japan, Jul. 21, 1989, 1-85859[U]; Jul. 27, 1989, 1-88778[U]; Jul. 17, 1990, 2-76019[U]

Int. Cl.[5] H05K *7/00*

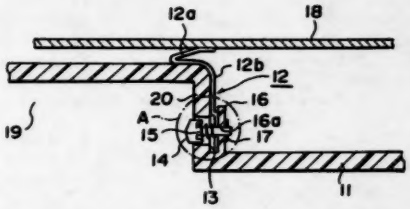
U.S. Cl. 439—76 **4 Claims**

1. A connector assembly adapted to be incorporated in an electronic device having a printed circuit board a battery pack holding section defined by a wall of a housing case for holding a battery pack, said connector assembly comprising:

a contact pattern provided on said printed circuit board; and

a spring connector having a spring contact of a leaf spring type movable by the spring force for being in contact with said contact pattern on said printed circuit board;

said spring connector including a terminal pin having a head electrically connectable to said battery pack, a coil spring carried by said terminal pin, a terminal leaf spring having a bent extended portion forming the spring contact and



having a base portion engaging with said terminal pin, and a mounting rib standing up from said housing case, each of said wall, said terminal leaf spring and said mounting rib having a hole through which said terminal pin extends and said mounting rib holding said terminal leaf spring with said coil spring pressing said terminal leaf spring against said mounting rib;

whereby the spring contact formed at the extended portion of said terminal leaf spring is in constant electric contact with the contact pattern on said printed circuit board.

5,066,236

IMPEDANCE MATCHED BACKPLANE CONNECTOR

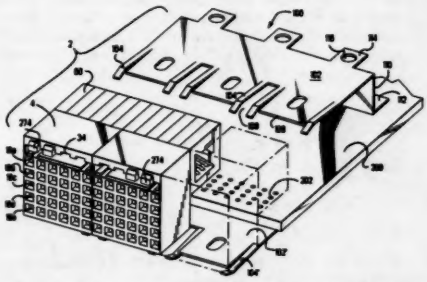
Johannes M. Broeksteeg, Ag Oss, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 19, 1990, Ser. No. 584,672

Claims priority, application United Kingdom, Oct. 10, 1989, 8922765; Oct. 10, 1989, 8922781

Int. Cl.[5] H01R *13/648*

U.S. Cl. 439—79 **36 Claims**



1. A controlled impedance right angle electrical connector assembly (2) comprising:

an insulating housing (2) having a front mating face (6) and a rear face (14), said housing a plurality of terminal receiving passageways, with the passageways arranged in an array of columns and rows; and

at least one terminal module (60,60') where the module (60,60') comprises:

(a) a stamped lead frame (62) including a plurality of edge stamped right angle contacts (64,65,66,67,67') where the contacts each include a printed circuit board interconnection section (76,77,78,79), an intermediate section (72,73,74,75) and a mating contact section

(68,69,70,71,71'); each consecutive intermediate section (72,73,74,75) increasing in length from the prior and adjacent contact, and

(b) an overmolded insert (82) discrete from the housing which encapsulates at least a portion of each intermediate section (72,73,74,75) in an insulative material leaving the remainder of each intermediate section (72,73,74,75) exposed to the air, the length of each intermediate section encapsulated within the insert decreasing as the intermediate portions increase in length, thereby balancing the impedance of the plurality of contacts.

5,066,237

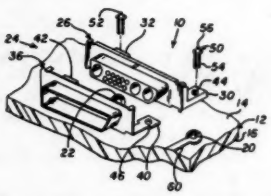
CONNECTOR PRESS FIT EYELET

Robert J. Shiley, Riverside, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 22, 1990, Ser. No. 600,654

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—82 **13 Claims**



1. A fastener for holding the leg of a plastic connector body and the leg of a metal shell lying thereunder, of predetermined combined thickness, to a circuit board having a hole and a grounded conductive trace extending to the hole, and for electronically connecting the shell to the circuit board trace, wherein the legs and circuit board have aligned holes, comprising:

a metal eyelet with a tubular portion having an axis, a top, and a cap at the top, said tubular portion having a plurality of slits therein forming a plurality of tines that project radially outwardly from adjacent areas of the tubular portion, whereby to retain said eyelet in said circuit board hole;

each of said tines having a contact part lying a distance below said cap equal to said combined thickness of said plastic body leg and said metal shell leg to lie adjacent to the bottom of said shell, and each contact part extends with a horizontal directional component to lie adjacent to the bottom of said shell hole.

5,066,238

ELECTRICAL SOCKET

Gray Shieh, Fl. 9-4, No. 106, Sec. 3, Hsin-I Rd., Taipei City, Taiwan

Filed May 28, 1991, Ser. No. 706,297

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—139 **5 Claims**

1. An electrical socket to receive an electrical plug having a number of contact blades, comprising:

a socket housing defining a plurality of conductor receiving spaces therein and having a front face provided with a plurality of spaced socket openings each serving as a passage into one of said conductor receiving spaces, a shaft opening disposed between said socket openings, and a control piece opening;

a conductor piece provided inside each of said conductor receiving spaces and adapted to be electrically connectable to one of said contact blades;

a socket cover including a rotary plate provided in said front face of said socket housing and having a plurality of openings, and a shaft projecting rearward from said rotary plate and extending through said shaft opening, said socket cover being movable between a closed position, wherein said rotary plate covers said socket openings, and an open position, wherein each of said openings of said rotary plate is aligned with one of said socket openings, to permit insertion of said contact blades of said electrical plug into said conductor receiving spaces;

a control member including a control piece provided in said control piece opening and a spring to urge said control piece to engage one of said openings in said rotary plate when said socket cover is in said closed position, engagement of said control piece with one of said openings of said rotary plate preventing rotation of said rotary plate relative to said socket housing, said control piece being disengageable from said rotary plate to permit rotation of said rotary plate from said closed position to said open position; and

a torsion spring means provided in said socket housing and being connected to said shaft and said socket housing, said torsion spring means returning said socket cover to said closed position when said contact blades of said electrical plug are pulled out of said electrical socket.

5,066,239

CLOCK SPRING

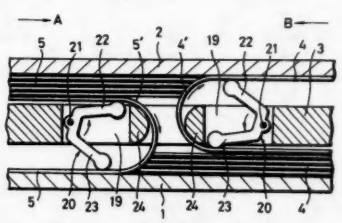
Hiroyuki Bannai, Furukawa, and Hironori Kato, Sendai, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 26, 1990, Ser. No. 634,244

Claims priority, application Japan, Dec. 26, 1989, 1-148721[U]

Int. Cl.[5] H01R *35/00, 39/02*

U.S. Cl. 439—164 **4 Claims**



1. A clock spring comprising:

a stationary member defining a first cable receiving portion;

a moveable member rotatably coupled to said stationary member, said moveable member defining a second cable receiving portion;

a first plurality of cables having one end fixed to said move-

able member and another end fixed to said stationary member, said first plurality of cables being wound in a first direction in said first cable receiving portion and wound in a second direction in said second cable receiving portion;

a second plurality of cables having one end fixed to said moveable member and another end fixed to said stationary member, said second plurality of cables being wound in said first direction in said second cable receiving portion and wound in said second direction in said first cable receiving portion;

a spacer rotatably disposed between said moveable member and said stationary member, said spacer including an opening; and

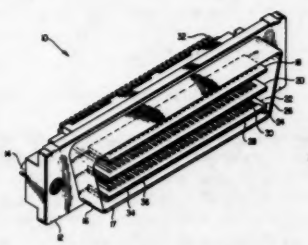
a plurality of guide members pivotably supported on said spacer adjacent said opening, each of said guide members having first and second arms with each arm terminating in a free end, wherein one guide member is provided for each cable of said first and second plurality of cables, and wherein each cable is trained over the free end of the first arm of its associated guide member, looped through said opening, and trained over the free end of the second arm of its associated guide member.

5,066,240

HIGH DENSITY ELECTRICAL CONNECTOR WITH ELECTROSTATIC DISCHARGE PROTECTION

Gary J. Verdun, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 24, 1990, Ser. No. 557,675
Int. Cl.[5] H01R *13/53*
U.S. Cl. 439—181 **16 Claims**



1. A plug type electrical connector comprising:

a block of insulative material, said block of insulative material including a widened base section and a narrower section integrally formed with and extending from said widened base section, said narrower section of said block of insulative material having a top side, a bottom side and a leading edge;

at least one electrical contact mounted to each of said top and bottom sides of said narrower section of said block of insulative material;

a conductive outer shell attached to said widened base section of said block of insulative material, said conductive outer shell at least partially surrounding said narrower section of said block of insulative material; and

an electrical conductor mounted to said narrower section of said block of insulative material, said electrical conductor positioned forward of said top and bottom side mounted electrical contacts relative to said leading edge such that electrostatic voltage potentials are discharged to said electrical conductor;

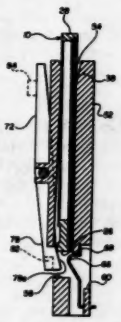
wherein said leading edge of said narrower section of said block of insulative material extends a slightly greater distance outwardly than a front edge of said conductive outer shell and wherein said narrower section of said block of insulative material further comprises sidewalls, said electrical conductor mounted on said leading edge of said insulative block extending along said sidewalls and the surface of said widened base section, said electrical conductor terminating at said conductive outer housing.

5,066,241

ELECTRICAL CONNECTOR APPARATUS FOR USE WITH AN INTEGRATED CIRCUIT CARD

Robert G. Hills, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1990, Ser. No. 539,653
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—260 **16 Claims**



1. Electrical connector apparatus providing connection to a contact area on a removable integrated circuit card, said card including a card locking member on a side opposite to the contact area, said connector apparatus comprising:

a housing having a recess for receiving the integrated circuit card;

flexible contact means for electrically connecting with the integrated circuit card, said contact means being pretensioned to project into said recess by a spring force;

a card engaging member supported for entry into said recess in opposed relation to said contact means, said card engaging member including a locking profile configured to engage said card locking member; and

means for biasing said card engaging member toward said contact means whereby the integrated circuit card is engaged therebetween and tensioned from opposing sides thereof to effect electrical connection between said contact means and said contact area on the card, said card locking member and said locking profile cooperatively engaging to secure the integrated circuit card in said recess.

5,066,242

ENVIRONMENT-PROOF ELECTRICAL CONNECTOR ASSEMBLY

Roberto Martucci, Montegrotto, Italy, assignor to Molex Incorporated, Lisle, Ill.

Filed Oct. 15, 1990, Ser. No. 597,469
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—281 **30 Claims**

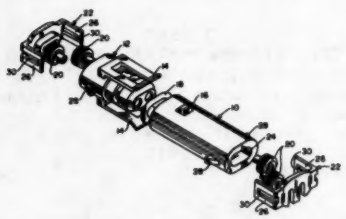
1. An environment-proof electrical connector assembly comprising:

a first connector having a male terminal;

a second connector mateable with the first connector and having a female terminal including conductive receptacle means defining a blind cavity for receiving the male terminal and for establishing an electrical connection with the male terminal within the blind cavity;

seal means on the first connector for closing said cavity in

response to mating of the connectors to seal said electrical connection from the environment; and



wherein said receptacle means and said seal means include telescoping sleeve portions sized and shaped to form a seal therebetween in response to mating of the connectors.

5,066,243

CONNECTOR HOUSING

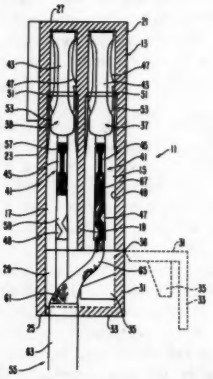
Karl Nuesslein, Birkenring 9, 8835 Pleinfeld-Mischelbach, Fed. Rep. of Germany; Antonio Motta, Via Bosiso 2, Monza 20052 MI, Italy, and Gerhard Schule, Kaadenerstr. 3, 8835 Pleinfeld, Fed. Rep. of Germany

Filed Apr. 20, 1990, Ser. No. 513,306

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913181

Int. Cl.[5] H01R *13/58*

U.S. Cl. 439—460 **11 Claims**



1. A connector housing having vertical walls made of an insulating material, comprising a plurality of contact element chambers to take up in each chamber a contact element connected to an electrical conductor, the connector housing provided with a flap at one of its vertical walls, the flap being connected to the vertical wall by means of a film hinge which allows pivoting between a releasable locking position wherein the flap is an extension of the vertical wall and an open position in which it protrudes from the vertical wall, constructed in such a way that at least one stress relieving nose protrudes from a cable inlet side of the connector housing in order to prevent a contact element located in a contact element chamber adjacent to the flap to be drawn out of the cable inlet side of the connector housing when the flap is in locking position and in order to allow the contact element to be inserted into the contact element chamber and the contact element to be removed from the contact element chamber via the cable inlet side of the connector housing when the flap is in an open position, characterized in that the connector housing has at least one pair of contact element chambers arranged parallel to each other in the direction of the stress relieving mechanism and in that the stress relieving mechanism is arranged in such a way that it narrows or engages behind the contact element chamber adjacent to the flap and in that the free end of the flap is equipped with a cover which protrudes from its interior side and closes the cable inlet side of the housing when the flap is in closing position, leaving open only an opening for an electrical conductor.

5,066,244

DETECTOR DEVICE FOR COUPLED CONNECTOR

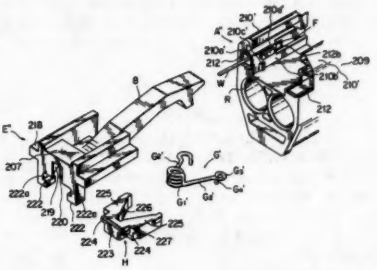
Tetsuo Kato; Naoto Taguchi, and Yoshihiro Murakami, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 21, 1991, Ser. No. 673,932

Claims priority, application Japan, Mar. 23, 1990, 2-72063; May 2, 1990, 2-115115; May 2, 1990, 2-115116

Int. Cl.[5] H01R *3/00*

U.S. Cl. 439—489 **7 Claims**



1. A detector device for coupled connectors comprising:

a first connector housing having a flexible lock arm;

a second connector housing having an engaging part in respect to said flexible lock arm;

a lock confirming slider;

sensor circuit terminals provided in the first connector housing; and

a short-circuiting terminal automatic lock confirming resilient piece provided on one of the first connector housing and the lock confirming slider, the lock confirming slider being automatically moved forwardly in the axial direction to contact the sensor circuit terminals and the short-circuiting terminal to each other when the first and second connector housings are completely fitted to each other.

5,066,245

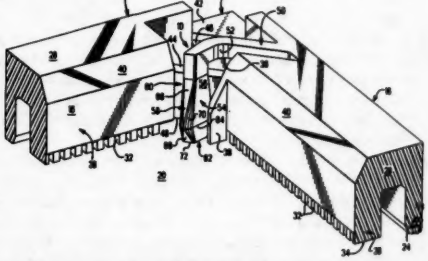
RETENTION DEVICE FOR FLAT PACK SOCKETS

Kevin E. Walker, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 9, 1990, Ser. No. 611,247

Int. Cl.[5] H05K *1/00*

U.S. Cl. 439—526 **8 Claims**



1. A retention device for retaining bumperless plastic quad

flat packs in a frame-shaped socket cover of the type having slots in the base for receiving end portions of leads extending outwardly from the pack, the retention device comprising:

a resilient arm attached to a cover wall adjacent each corner and extending into an opening into which a flat pack may be received; and

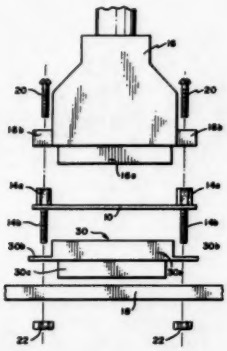
an engaging member attached to and extending perpendicular from an end of said arm and having a flat surface facing in and slanted outwardly, said flat surface adapted to engage a flat surface of a reversed slanted orientation on the flat pack to urge the flat pack outwardly against the restraining force of the end portions in the slots.

5,066,246

MOUNTING BRACKET FOR AN ELECTRICAL CONNECTOR

James B. Jensik, 2337 Frey Ave., Venice, Calif. 90291

Filed Nov. 27, 1990, Ser. No. 618,736
Int. Cl.[5] H01R *13/621*
U.S. Cl. 439—562 **9 Claims**



1. A mounting bracket for an electrical connector comprising:

(a) a bracket body defining an opening to accommodate at least a portion of the electrical connector; and,

(b) a plurality of stud members non-removably and non-rotatably attached to the bracket body, each stud member comprising:

(i) a head portion extending from one side of the bracket body, the head portion defining an internally threaded hole to threadingly accept a mounting screw to attach the electrical connector to the bracket; and

(ii) a threaded stud portion extending from an opposite side of the bracket body, the stud portion having external threads thereon.

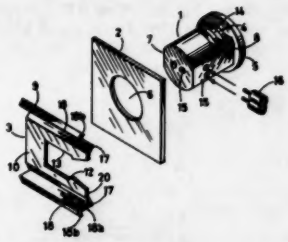
5,066,247

ELECTRICAL FITTING FOR PANEL CONSTRUCTION

James F. Watson, 240 Calle Cemlo, La Guacima de Alajuela, Costa Rica

Filed Feb. 23, 1990, Ser. No. 483,878
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—565 **6 Claims**

1. A multi-purpose electrical fitting adaptable for use as a connector, an outlet, a light socket or a switch comprising a basically cylindrical form having a pair of diametrally opposed flat surfaces and formed on said cylindrical form and extending the length of said form, one end of said form terminating in a cylindrical flange of greater diameter than said form, an opposite end of said form having a flat surface; a plurality of diametrally opposed transverse grooves spaced along the length of said form at right angles to said pair of flat surfaces; a flat rectilinear U-shaped retaining clip of tempered material having inner edges for insertion into one pair of said opposing transverse grooves to securely hold said fitting against a panel or lamina having an opening into which said fitting is inserted, said clip having parallel leg members spaced apart equal to the spacing of the bottoms of the opposed grooves; said fitting



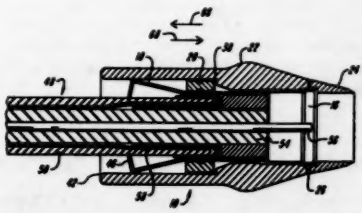
further having at least one pair of electrical conduit wire receiving sockets in at least one of said flat surfaces, said sockets being of electrically conductive material and integral with internal integrated electrical circuitry of said fitting.

5,066,248

MANUALLY INSTALLABLE COAXIAL CABLE CONNECTOR

Joseph C. Gaver, Jr., Horseheads, and James C. Jorgenson, Montour Falls, both of N.Y., assignors to LRC Electronics, Inc., Horseheads, N.Y.

Filed Feb. 19, 1991, Ser. No. 657,508
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 **10 Claims**



1. A coaxial cable connector for mating a coaxial cable to an interface port, wherein said coaxial cable includes a center conductor, an interior insulation, a braided shield and an insulating jacket and said interface port includes a conductive receptacle and an outer sheath, said coaxial cable connector comprising:

a housing having a cable insert end and an interface end;

a connector body dimensioned to fit substantially within said housing, said connector body comprising a slotted collar end, a resilient fingered end and an intermediate portion therebetween, said resilient fingered end having a plurality of axial serrations disposed thereon;

a center post having an annular portion with an outer dimension sized for engagement with said intermediate portion of said connector and a tubular portion dimensioned to receive said interior insulation and to electrically engage said braided shield of said coaxial cable; and

a locking ring having an inner dimension to snugly, slidable engage said resilient fingered end of said connector body and an outer dimension slidably engagable with a portion of said housing,

wherein said coaxial cable is manually installable within said coaxial cable connector by actuating said housing in a first direction such that said axial serrations of said connector body pierce said insulating jacket and said coaxial cable connector is manually installable on said interface port by actuating said

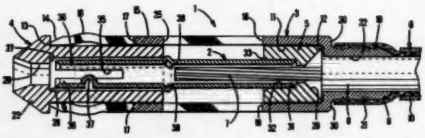
housing in a second direction to facilitate frictional engagement of said slotted collar end of said connector body and said outer sheath of said interface port.

5,066,249

COAXIAL SUBMINIATURE CONNECTOR

Dennis L. Doye, Mount Joy, and Michael R. Sneed, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 18, 1990, Ser. No. 629,733
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—585 **4 Claims**



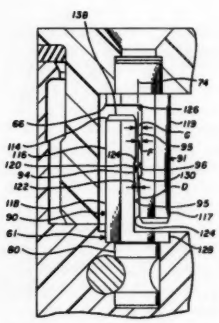
1. A coaxial connector comprising; a conductive electrical contact for connection with a signal conductor of an electrical cable, a conductive shell concentrically encircling the contact for connection with a conductive shield of the cable, a dielectric body encircled by a forward portion of the shell and concentrically between the contact and the shell, the dielectric body having a contact receiving cavity with a rear facing wall and a rear end inside the shell, the contact being received in the cavity with a front end of the contact facing the wall, projections on the exterior of the contact that are continuous with an exterior surface of the contact engaging the rear end of the dielectric body and preventing the front end of the contact from abutting the rear facing wall, buldged projections on the inside of the shell formed by indentations in the exterior of the shell radially compressing together the shell and the dielectric body and the contact, and a second dielectric body encircled by the shell and receiving a rear end of the contact, the second dielectric body having a forward facing shoulder at the rear end of the contact.

5,066,250

POLARIZING KEY PERMITTING CONNECTOR DISPLACEMENT

David E. Welsh, Tustin, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 21, 1990, Ser. No. 605,445
Int. Cl.[5] H01R *13/64*
U.S. Cl. 439—681 **6 Claims**



3. A connector arrangement comprising:

first and second electrical connectors which have contacts that mate when the connectors are moved in forward directions toward each other, said first connector having a first key mounted thereon and said second connector having a second key mounted thereon;

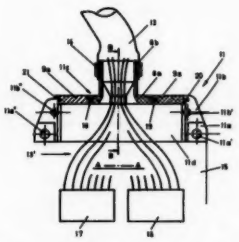
each of said keys has a keying portion with an interfitting side which lies opposite the interfitting side of the other key with an imaginary plane between said interfitting sides, when said connectors are mated, and each interfitting side has forward and rearward parts with each rearward part being indented with respect to the forward part, and with each forward part lying closer to said plane than the rearward part.

5,066,251

DEVICE CONNECTABLE TO THE REAR COVER OF A CONNECTOR

Per-Olof Lundberg, Karlskoga, and Sven-Olov Pettersson, Karlstad, both of Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Jun. 28, 1990, Ser. No. 544,889
Claims priority, application Sweden, Jun. 30, 1989, 8902371
Int. Cl.[5] H01R *13/514*
U.S. Cl. 439—701 **19 Claims**



1. An apparatus connectable to the rear cover of a connector for facilitating entry and exit of the cable leads of the connector, said apparatus comprising:

a hood-shaped member having a side portion and a top portion, said top portion including at least two exchangeable modular elements including plate-like parts, at least some of said parts being apertured and provided with a transition member for entry of the cable leads, each transition member being adapted for receiving cable leads designated for different terminal blocks of the connector, and locking means provided on said modular members of said top portion and said side portion for interconnecting said modular elements therebetween to form said top portion and for connecting said top portion to said side portion.

5,066,252

RETAINER FOR METAL TERMINAL OF ELECTRIC CONNECTOR

Tetsuo Kato; Kiyohito Fukuda; Hiroshi Watanabe; Katsuaki Terada, and Naoto Taguchi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,727
Claims priority, application Japan, Jun. 27, 1989, 1-162627
Int. Cl.[5] H01R *13/436*
U.S. Cl. 439—752 **6 Claims**

1. An electric connector comprising:

a connector housing having opposed outer peripheral walls and a plurality of juxtaposed terminal receiving chambers;

a plurality of metal terminals which are inserted respectively into the terminal receiving chambers, each of said metal terminals having a retaining hole formed in a base thereof;

a terminal retainer, combined with and movable in at least two different directions within said connector housing, for shifting from a provisionally-locked condition to a completely-locked condition;

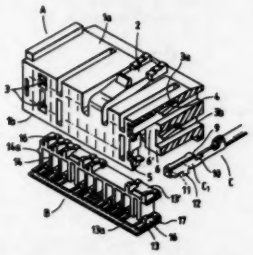
a window, provided in one of said opposed outer peripheral walls of the connector housing, the window extending

across the plurality of terminal receiving chambers, and extending through the connector housing to the other of said opposed outer peripheral walls;

a hook-shaped deformable locking arm, provided at one side edge of said window in facing relation to said portion of said window extending through said connector housing;

said terminal retainer including a lid member for closing the window, the lid member having at its inner surface retaining projections each engageable in the retaining hole of a respective one of the metal terminals, and having a projection engageable with the locking arm;

partition plates connected to said lid member and corresponding in number to said plurality of terminal receiving chambers;



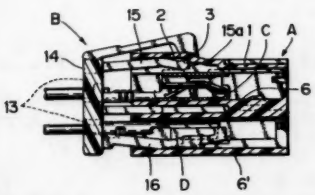
wherein the terminal retainer is provisionally locked to the connector housing upon insertion into the connector housing at the window in a first direction, such that, in the provisionally-locked condition, when the terminal retainer is moved in a second direction toward the locking arm, the second direction being different from the first direction, the locking arm is engaged with an end face of the projection, thereby completely locking the terminal retainer to the connector housing, and at the same time the retaining projections are engaged in the retaining holes, so as to prevent rearward withdrawal of the metal terminals.

5,066,253

ELECTRIC CONNECTOR WITH A TERMINAL LOCKING MECHANISM

Isao Kameyama, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Mar. 4, 1991, Ser. No. 663,528
Claims priority, application Japan, Mar. 19, 1990, 2-67347
Int. Cl.[5] H01R *13/514*
U.S. Cl. 439—752 **3 Claims**



1. An electric connector with a locking mechanism, comprising:

a connector housing provided with at least one terminal chamber to accommodate herein a terminal and having at an upper wall thereof an opening communicating with said at least one terminal chamber;

a terminal locking member having a terminal holding finger adapted to be inserted into said at least one terminal chamber, said terminal locking member being capable of being joined to said connector housing at a rear end thereof in a temporarily assembled state and in a completely assembled state;

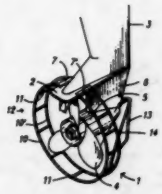
characterized in that the terminal locking member is provided with a flexible unlocking lever having at its free end an unlocking projection, said unlocking projection rests on said upper wall of the connector housing in the temporarily assembled state and the unlocking projection sinks through said opening in the upper wall into said at least one terminal chamber in the completely assembled state.

5,066,254

BOAT PROPELLER GUARD

Joseph D. Bass, 4119 N. Citrus Ave., Crystal River, Fla. 32629, and Leroy H. Steinhilber, 5849 W. Tirana La., Dunnellon, Fla. 32630

Filed Feb. 12, 1990, Ser. No. 478,444
Int. Cl.[5] B63H *5/16*
U.S. Cl. 440—72 **9 Claims**



1. A boat propellor guard comprising:

(a) a circular section made from two metal bars shaped into two circles each having a diameter at least slightly larger than the diameter of the circle travelled by the tips of the propellor blades, said two circular bars being spaced from and substantially parallel to each other and joined by a plurality of spacer bars spaced from each other and connected to said circular bars, each of said circular bars having an open section therein with the two said open sections being opposite to each other;

(b) a first and a second bracket means, the first bracket means attached to one pair of the ends of said circular bars at one side of said open section and the second bracket means being attached to the other pair of ends of circular bars at the said open section, said bracket means being capable of securing said guard to the cavitation plate of a boat propellor, each of said bracket means having an opening therein:

(c) a bolt and nut adapted to fit into said bracket means openings and to press said bracket means toward each other and to lock onto said cavitation plate when said nut is tightened on said bolt;

(d) at least two bars spaced from each other and joined to and extending from one of said circular bars, said bars bending inwardly to meet each other a substantial distance from the circular bar to which they are attached, the said bars being attached to said circular bar at a substantial distance from the open section in said circular bar, the arrangement of said bars extending from said circular bar having a general conical configuration; and

(e) a third bracket means positioned near the apex of said conical configuration and supported by one of said bars in said conical configuration, said third bracket means being adapted to become tightly secured against a supporting section for said propellor;

in which in said first and second bracket means each bracket means comprises a flat portion adapted to lay flat on said cavitation plate and a flap extending at an angle downward from said flat portion, said flap having at least one opening therein capable of having a bolt passed therethrough; said third bracket means comprising a single flat piece bent into a V-shaped bracket capable of being pressed against and maintaining secure contact against a supporting section for said propel-

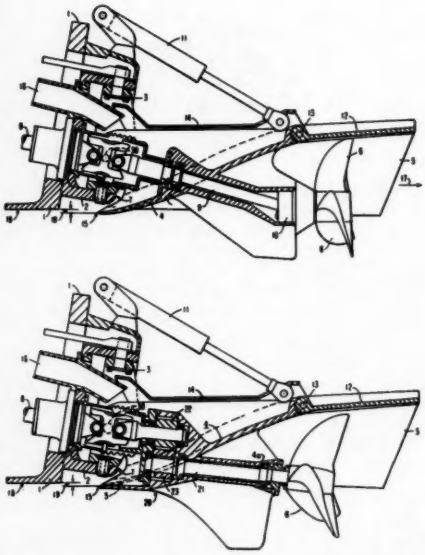
lor; said V-shaped bracket being attached to and extending inwardly from said general conical configuration toward said supporting section for said propellor.

5,066,255

DRIVE ARRANGEMENT FOR A PLANING BOAT

Roland Sand, Hintere Strasse 40, 6729 Neupotz, Fed. Rep. of Germany

Filed Jun. 20, 1990, Ser. No. 541,063
Claims priority, application European Pat. Off., Jul. 11, 1989, 89112617.9
Int. Cl.[5] B63H *23/36*
U.S. Cl. 440—112 **8 Claims**



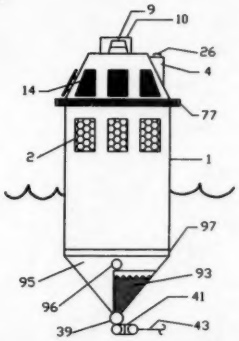
1. A drive arrangement for a planing hull boat having a motor arranged within the hull, a drive shaft extending from said motor through the stern wall of said hull and including at least one universal joint disposed outside said hull, a tunnel-shaped water flow guide structure extending backwardly from the bottom edge of said stern wall and upwardly in a curved fashion, a propeller supported in said tunnel-shaped water flow guide structure adjacent the rear end thereof so as to be rotatable about an axis which is essentially parallel to and in alignment with the planing hull bottom surface and which is operatively connected to said drive shaft by way of an intermediate shaft with an additional joint, said tunnel-shaped water flow guide structure having side wall sections and a top end section above said propeller hinged so as to be tiltable about a horizontal axis and disposed in sealing relationship with respect to the side wall sections, the front end of said tunnel-shaped water flow guide structure defining a gap which is open in the direction of movement of said boat and forming a scoop adapted to scoop up a stream of water during operation of the boat, which stream is directed over said flow guide structure thereby forming a water seal preventing any air leakage into said tunnel-shaped water flow guide structure.

5,066,256

BUOY AND RELEASING SYSTEM FOR SHIPS IN DISTRESS

Robert B. Ward, Sr., Rte. #1, Box 175, Jane Lew, W. Va. 26378

Continuation of Ser. No. 311,942, Feb. 17, 1989, abandoned.
This application Oct. 3, 1990, Ser. No. 593,466
Int. Cl.[5] B63B *22/08, 22/18*
U.S. Cl. 441—7 **8 Claims**



1. A buoy marker and a releasing apparatus for said marker for use on craft that may become submerged comprising:

a) Buoy means having top and bottom and signalling means located at the top of said buoy, said buoy being bottom heavy, said signalling means being in connection with a mercury switch capable of activating said signalling means, said mercury switch capable of becoming operational when said buoy is in an upright position, protective band located around the outer diameter of said buoy and close to the top of said buoy, said band having larger diameter than said buoy;

b) buoy releasing system comprising: resting plate comprising a resilient material with an aperture in the center, said aperture of larger diameter than said buoy and smaller diameter than said protective band so that said top of buoy is capable of protruding through said aperture and said protective band is capable of supporting said buoy upon said resting plate, a plurality of guide rods attached to said plate and arranged in a circular orientation to form a storage space, said storage space having bottom opening around said aperture and top opening above, so that said buoy is capable of resting within said storage space and moving out of said space through said top opening when said craft becomes submerged, frictionless reel means attached to said buoy by a cable.

5,066,257

PROCESS FOR PRODUCING FLAT PLATE ILLUMINATION DEVICES

Peter W. Farner, 3315 Lorraine, Kalamazoo, Mich. 49008, and Franklin H. Cocks, 5 Learned Pl., Durham, N.C. 27705

Filed Feb. 9, 1990, Ser. No. 477,714
Int. Cl.[5] H01J *9/39*
U.S. Cl. 445—26 **11 Claims**

1. A process for producing flat-plate, gas discharge, illumination devices which comprises a cutting step utilizing a high pressure water jet, said water jet carrying an abrasive grit, an assembly step comprising the placing of the integral, interior electrodes in the channels cut into a middle plate by said cutting step, together with the assembly of front and back plates about said middle plate to form a non-hermetic channel containing electrodes, said plates being assembled on the surface of a carrier platen, said carrier platen being covered with a ceramic powder to prevent adhesion of said bottom plate to said carrier platen, said ceramic powder having a sieve size less

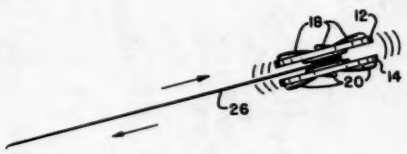
than 200, a sealing step comprising the heating of the combination of top, middle, and bottom plates, and said carrier platen to a temperature sufficiently high to soften and to seal said top, middle, and bottom plates hermetically together, including the hermetic sealing of electrical feed-throughs to the said electrodes by means of glass frit, a cooling step, comprising the cooling of the tubulated assembly to a temperature low enough to allow evacuation hoses to be connected to said tube, an evacuation and backfilling step comprising the evacuation of air from the said channel and the replacement of this evacuated air by backfilling the said channel with the desired fill gas, a final sealing step comprising the hermetic sealing of the said evacuation and backfilling tube.

5,066,258

RETURNING FLYING TOY

Rand K. Tomberlin, 4017 N. Bennington, Apt. 104, Kansas City, Mo. 64117

Filed Jan. 7, 1991, Ser. No. 638,186
Int. Cl.[5] A63H *33/18*
U.S. Cl. 446—40 **20 Claims**



1. A returning flying toy, comprising:

first and second rotary elements, each of said elements having a longitudinal axis and being adapted for rotation about said axes, at least said first rotary element including a plurality of first members extending outwardly from said longitudinal axis of said first rotary element, at least a portion of said plurality of first members being capable of producing aerodynamic lift in a direction substantially parallel to said longitudinal axis of said first element when said first element is rotated about its said longitudinal axis;

a hub extending between said rotary elements and coupling said elements in spaced opposed relation with said axes substantially coincident, said hub being substantially coaxial to said axes of said elements; and

a length of flexible line, a first end of said line being coupled to said hub, and said line being adapted to be wound upon, and unwound from, said hub.

5,066,259

DOLL STRUCTURE INCORPORATING MATERIAL SIMULATING NATURAL BODY WEIGHT AND FEEL

Judith S. Acker, 505 Edinburgh St., San Mateo, Calif. 94402

Filed May 17, 1990, Ser. No. 525,236
Int. Cl.[5] A63H *3/36*
U.S. Cl. 446—385 **5 Claims**

1. A doll structure, comprising:

a) a doll body including trunk, head, arms and legs interconnected to form a composite simulation of a human child;

b) means within said doll body having a density attributing to said doll body a weight factor approximately the weight factor of a live child of approximately the same size;

c) means covering the exterior surface of the doll body and simulating the "feel" and appearance of human tissue;

d) said means within the doll body having a density attributing to said doll body a weight factor approximating the weight of a live child of approximately the same size comprising one or more masses of a soft, pliant, elastically compressible polymer gel material; and

e) said mass of soft, pliant and elastically compressible polymer gel material is hollow, and the hollow within said mass is filled with a soft, pliant and compressible mass of fiber-fill material constituting a mat of unoriented separate filaments of natural or synthetic fibers the density of

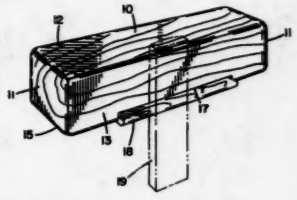
which is less than the density of the mass of polymer gel material.

5,066,260

WILD TURKEY CALLER

J. Monroe Lindler, 180 W. Hwy. 378, Lexington, S.C. 29072

Filed Feb. 26, 1988, Ser. No. 160,816
Int. Cl.[5] A63H *5/00*
U.S. Cl. 446—397 **4 Claims**



1. A game caller substantially rectilinear in shape having top, side and end walls of wood forming a box-like resonator chamber, a bottom vibrator plate of graphite-epoxy laminate material enclosing said chamber, a friction edging strip secured to one side edge of said vibrator plate and projecting laterally beyond the adjacent side wall said strip adapted to cause vibration of said vibrator plate when said strip is stroked by a striker bar, and the bottom edge of the side wall adjacent said edging strip having a slot therein above said edging strip to allow free vibration of said vibrator plate.

5,066,261

COIN HOPPER ASSEMBLY

Michael O. Parham, 5801 Evergreen, Las Vegas, Nev. 89107

Filed Feb. 21, 1990, Ser. No. 482,819
Int. Cl.[5] G07D *1/00*
U.S. Cl. 453—57 **11 Claims**

1. A coin hopper assembly comprising:

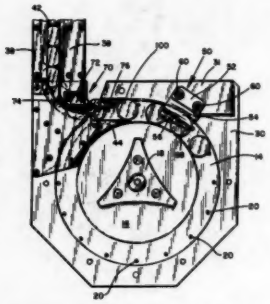
(a) a hopper frame having a mounting plate attached thereto,

(b) a hopper basket mounted to the mounting plate,

(c) a shelf plate mounted to the mounting plate inside the hopper basket, the shelf plate including a pin wheel,

(d) a wiper member mounted to the mounting plate adjacent the pin wheel, the wiper member including an end section having a tapered coin engaging edge disposed generally

perpendicular to the plane of travel of the pin wheel whereby only a single coin oriented on the pin wheel may pass by the wiper member, and



(e) the wiper member attached to the mounting plate by means of a mounting screw including a tension spring that allows the wiper member to move perpendicularly to the plane of travel of the pin wheel.

5,066,262

COIN DISPENSING APPARATUS

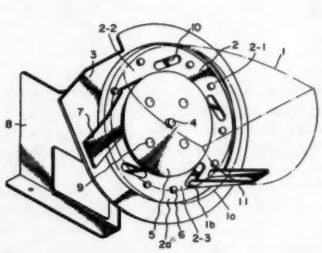
Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 589,059

Claims priority, application Japan, Oct. 3, 1989, 1-115854[U]; Jun. 13, 1990, 1-61751[U]; Aug. 2, 1990, 1-81727[U]

Int. Cl.[5] G07D *1/00*

U.S. Cl. 453—57 **5 Claims**



1. A coin dispensing apparatus comprising a supporting plate inclined to the horizontal, a hopper mounted on the supporting plate for holding a supply of coins, a rotary disc rotatably supported on the supporting plate within the hopper, the rotary disc having a circular central shelf in the center thereof of a diameter depending on a diameter of a coin to be dispensed and having a plurality of sequential feeding pins spaced along the peripheral portion thereof, the hopper having an inclined bottom surface extending towards a lower peripheral portion of the rotary disc and a gutter forming lower portion connected to a lower end of the inclined bottom surface, and the peripheral portion of the rotary disc being provided with a plurality of inclined grooves inset into the rotary disc, each extending substantially in a direction tangential to the periphery of the circular central shelf and being between the sequential feeding pins.

5,066,263

RESILIENT SHAFT COUPLING

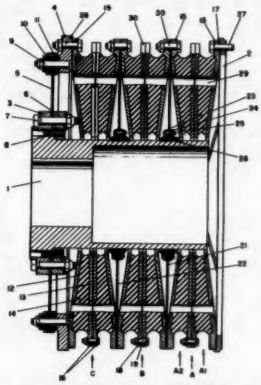
Manfred Lunke; Ulrich Falz, both of Dortmund, and Jürgen Walter, Haltern, all of Fed. Rep. of Germany, assignors to Hackforth GmbH & Co. KG, Herne, Fed. Rep. of Germany

Filed Nov. 2, 1990, Ser. No. 608,291

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1989, 3938261

Int. Cl.[5] F16D *3/68*

U.S. Cl. 464—96 **3 Claims**



1. A resilient shaft coupling essentially comprising a hub on a drive side of said shaft coupling, a flange ring on an end of said drive shaft opposite to said drive side, said hub and said flange ring being connected in a torsionally resilient manner via a series of identical elastic annular connecting links, connected in series, which annular connecting links are formed by two abutting ring halves that are mirror-symmetrical to a dividing plane perpendicular to a rotation axis of said shaft coupling, each said ring half being provided with outer metallic ring plates, which are composed of congruent ring segments whereby said congruent ring segments are connected by rubber segments of identical surface areas which are vulcanized to said ring segments and have in their axial plane a trapezoidal cross-sectional shape with a radially outwardly increasing width, with said ring segments of said one ring half being staggered, and said outer metallic ring plates of said two abutting respective ring halves at said dividing plane being clamped at first connecting rims, and adjoining ones of said outer metallic ring plates of neighboring ones of said annular connecting links being clamped at second connecting rims, with a radial support being also provided at said hub; said resilient shaft coupling further comprising:

a metallic ring membrane being clamped between said second connecting rims of each two of said neighboring ones of said annular connecting links, with each of said ring membranes having a boring, that tightly embraces said hub through sliding means, so as to support said ring membrane at said hub in a radially rigid, but axially and in a circumferential direction flexible fashion that also allows angular motion.

5,066,264

GEAR FOR BICYCLES AND A FREEWHEEL FOR BICYCLES INCLUDING A PLURALITY OF SUCH GEARS

Antonio Romano, Padua, Italy, assignor to Campagnolo Srl, Vicenza, Italy

Filed Nov. 21, 1990, Ser. No. 616,967

Claims priority, application Italy, Nov. 21, 1989, 68028 A/89

Int. Cl.[5] F16H *7/00*

U.S. Cl. 474—152 **6 Claims**

1. A bicycle gear which is intended to mesh with a bicycle

chain (10) as a result of the operation of a derailleur device (3) associated with the chain (10). wherein the teeth of the gear are in successive sets of three constituted each by teeth of the following three types arranged in succession in the opposite sense from that in which the gear usually rotates when the bicycle is in use:

a) a first tooth (14) with a recessed surface portion in one of its faces,

b) a second tooth (15) with a groove (19) formed in a top surface of the tooth and extending circumferentially of the gear,

c) a third tooth (16) with a top chamfer (20) on its face which is on a side opposite the recessed surface portion of the first tooth (14).

5,066,265

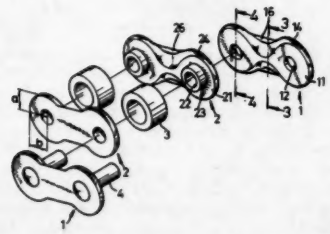
CHAIN

Chia L. Wu, No. 734, Chung Shan Rd., Kwei Jen Hsiang, Tainan Hsien, Taiwan

Filed Jan. 3, 1991, Ser. No. 637,293

Int. Cl.[5] F16G *13/00*

U.S. Cl. 474—206 **2 Claims**



1. A chain comprising a plurality pairs of inner and outer chain plates linked by rollers and pins, wherein the improvement comprises:

each said chain plate having a flat outer surface and an inclined surface along upper and lower edges of an inner face thereof, said inclined surface extending from first ends to second ends of said chain plates, said chain plates each having a blade portion merging with said inclined surface at central straight portions thereof, said blade portions having a greater slope than said inclined surfaces, thereby enlarging a width between two inner chain plates.

5,066,266

TRANSMISSION ARRANGEMENT FOR VEHICLE HAVING MOTOR SHAFT PARALLEL TO AUXILIARY SHAFT WHICH DRIVES A FLUID COUPLING THROUGH A PLANETARY GEAR REDUCTION

Manabu Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

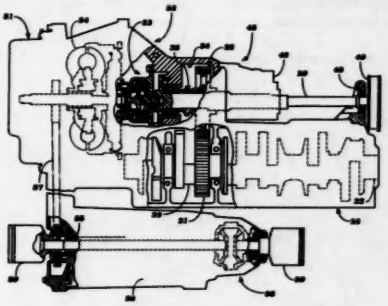
Filed Dec. 14, 1990, Ser. No. 627,727

Claims priority, application Japan, Dec. 15, 1989, 1-323988

Int. Cl.[5] F16H *37/08*

U.S. Cl. 475—59 **18 Claims**

1. A transmission arrangement for an internal combustion engine having an output shaft journaled for rotation about a first axis, an auxiliary shaft driven by said output shaft and rotatable about a second axis parallel to said first axis, a fluid



coupling, and transmission means for driving said fluid coupling from said auxiliary shaft at a reduced speed ratio.

5,066,267

TRANSMISSION HAVING AN ECCENTRIC AND A CYCLOID GEARING

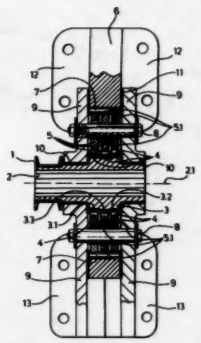
Florian Fischer, Ebersberg, and Christian Ritzer, Unterhaching, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Oct. 10, 1990, Ser. No. 596,717

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 3937909

Int. Cl.[5] F16H *1/28*

U.S. Cl. 475—168 **11 Claims**



1. A transmission for driving a swivel joint between two parts which are rotatable relative to each other, comprising a drive shaft having a multiple eccentric, cam disks driven by said multiple eccentric, each having an outer edge in the form of a closed cycloidal path and being disposed in driving engagement with gearing of a central wheel, a driving element subdivided into two driving disks and engaging by means of driving pins with said cam disks by way of bores therein, wherein the central wheel and the cam disks are arranged between the two driving disks, the driving disks being connected by said driving pins and being arranged so that they can be rotatably moved with respect to the multiple eccentric, the cam disks and central wheel.

5,066,268

TORQUE DISTRIBUTION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

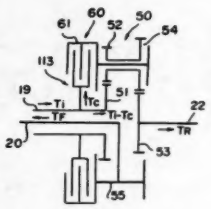
Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1990, Ser. No. 485,092

Claims priority, application Japan, Feb. 28, 1989, 1-048150; Jun. 30, 1989, 1-170895

Int. Cl.[5] F16H *1/42*

U.S. Cl. 475—249 2 Claims



1. A system for controlling torque distribution to front wheels and rear wheels of a motor vehicle having a manual transmission with an output shaft, the system comprising:

a planetary gear device including a first sun gear connected to said output shaft of said transmission, first and second planetary pinions integral with each other, a carrier provided to rotatably support said pinions and operatively connected to said front wheels, and a second sun gear operatively connected to said rear wheels;

said first planetary pinion being engaged with said first sun gear, and said second planetary pinion being engaged with said second sun gear;

means for selectively connecting said first sun gear and said carrier of said planetary gear device so as to restrict differential operations of said planetary gear device.

5,066,269

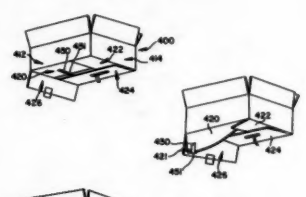
METHOD AND APPARATUS FOR CLOSING BOTTOM END FLAPS OF A CARTON

John L. Center; William C. Mills, Jr., both of Dallas, Tex., and John R. Plaskett, Chattanooga, Tenn., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Aug. 25, 1989, Ser. No. 398,807

Int. Cl.[5] B31B *1/50*

U.S. Cl. 493—183 10 Claims



1. A method for closing the bottom end flaps of a rectangular carton having sequentially adjacent first, second, third and fourth sides which form the body of the carton, the four sides having first, second, third and fourth bottom end flaps extending respectively therefrom, the method including the steps of:

(a) providing a carton in an expanded rectangular position having its bottom end flaps extending downward relative to the body of the carton;

(b) providing biasing means to bias said end flaps outwardly with respect to the sidewalls of the body of the carton;

(c) providing a programmable sequence controller for sequentially controlling release of the biasing means and closing of the bottom end flaps;

(d) providing closing means for closing the bottom end flaps in a preset sequence under control of the sequence controller by folding each end flap whose bias has been released towards the interior of the carton while maintaining a bias on each unfolded end flap; and

(e) providing the end flaps in a secure position by means of disposing at least two end flaps in locking relationship to each other.

5,066,270

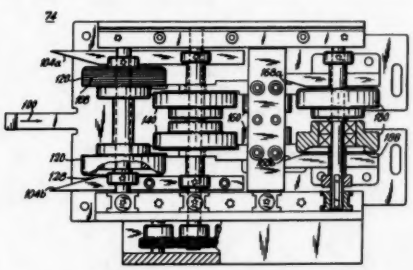
APPARATUS FOR FORMING INNERFRAME FOR CIGARETTE PACK WITH ROUNDED CORNERS

John Tomanovits, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Sep. 19, 1990, Ser. No. 585,224

Int. Cl.[5] B31B *3/26, 7/26*

U.S. Cl. 493—435 14 Claims



1. Apparatus for forming an innerframe for a cigarette package, said innerframe having a generally C-shaped cross section including a front surface portion, two side surface portions, and two rear flap portions, the front surface portion being between said side surface portions, and each of said side surface portions being between the front surface portion and a respective one of said rear flap portions, said front surface portion being joined to each of said side surface portions by a first corner region including a plurality of closely spaced score lines substantially parallel to the axis about which said innerframe will be bent between said front surface portion and said side surface portion, and each of said side surface portions being joined to the adjacent rear flap portion by a second corner region including a plurality of closely spaced score lines substantially parallel to the axis about which said innerframe will be bent between said side surface portion and said rear flap portion, said apparatus comprising:

a first roller having radially inwardly rounded axial end edges, the axial distance between said axial end edges corresponding to the spacing between said second corner regions, and the inward curvature of said rounded axial end edges corresponding to the curvature desired for said second corner regions;

a second roller cooperating with said first roller to form a first nip, said second roller having radially outwardly extending axial end flanges, each of said axial end flanges being axially beyond but adjacent to a respective one of the axial end edges of said first roller, and the surface of each flange opposite said rounded end edge being rounded to complement the associated rounded end edge of said first roller;

means for feeding said innerframe to said first nip with each of said second corner regions aligned with a respective one of said rounded end edges so that as said innerframe passes through said first nip, said rounded end edges and the adjacent rounded flange surfaces cooperate to bend

each of said second corner regions to the desired curvature;

a third roller having radially inwardly rounded axial end edges, the axial distance between the axial end edges of said third roller corresponding to the spacing between said first corner regions, and the inward curvature of said rounded axial end edges corresponding to the curvature desired for said first corner regions;

a fourth roller cooperating with said third roller to form a second nip, said fourth roller having radially outwardly extending axial end flanges, each of the axial end flanges of said fourth roller being axially beyond but adjacent to a respective one of the axial end edges of said third roller, and the surface of each flange opposite a rounded end edge of said third roller being rounded to complement the associated rounded end edge of said third roller; and

means for feeding said innerframe to said second nip with each of said first corner regions aligned with a respective one of said rounded end edges of said third roller so that as said innerframe passes through said second nip, the rounded end edges of said third roller and the adjacent rounded flange surfaces of said fourth roller cooperate to bend each of said first corner regions to the desired curvature.

5,066,271

BLADE-SUPPORT SYSTEM FOR CENTRIFUGE

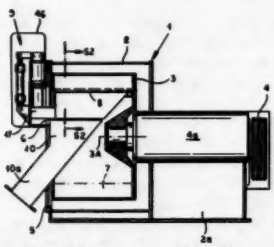
Guntram Krettek, Viersen, and Wilhelm Schmitz, Schwalmtal, both of Fed. Rep. of Germany, assignors to Krupp Industrietechnik GmbH, Duisburg, Fed. Rep. of Germany

Filed Feb. 14, 1990, Ser. No. 479,711

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1989, 3904358

Int. Cl.[5] B04B *11/08*

U.S. Cl. 494—58 **18 Claims**



1. A centrifuge comprising:

a generally stationary and closed drum housing having a housing end wall;

a drum rotatable in the drum housing about a drum axis and having an outer drum wall extending generally along the axis;

a blade extending generally axially in the drum housing generally parallel to the outer drum wall;

a blade support having

a generally axially extending beam projecting axially through the housing end wall and carrying the blade and

a generally radially extending shaft outside the drum housing and fixed to the beam;

an actuator housing fixed on the drum housing and including an upper part slidably receiving the shaft and

a lower part supporting the shaft on the drum housing for sliding movement of the support and blade on the drum housing in an adjustment direction generally radial of the drum axis;

glide pads between the actuator housing and the blade support;

at least one seal snugly engaged between the blade support and the actuator housing and hermetically sealing the actuator housing around the blade support; and

an actuator engaged between the actuator housing and the shaft for displacing the support and blade in the adjustment direction relative to the drum housing.

5,066,272

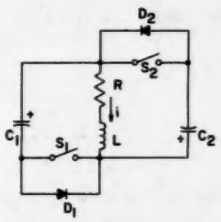
MAGNETIC NERVE STIMULATOR

Harry A. C. Eaton, Columbia, and Robert S. Fisher, Cockeysville, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jun. 29, 1990, Ser. No. 545,801

Int. Cl.[5] A61N *1/00*

U.S. Cl. 600—9 **29 Claims**



1. A magnetic nerve stimulator comprising:

power supplying means for supplying electric charge;

at least two capacitor means connected to said power supplying means for accumulation said electric charge from said power supplying means;

a coil connected to said capacitor means, said coil producing a magnetic pulse when one of said capacitor means discharges said electric charge through said coil and said coil forcing an electric current induced by the magnetic field energy from said coil to charge another of said capacitor means; and

at least two switching means for connecting and disconnecting said capacitor means to said coil to permit the charging and discharging of each of said capacitor means by turns.

5,066,273

Patent Not Issued For This Number

5,066,274

TETRAPYRROLE THERAPEUTIC AGENTS

Jerry C. Bommer, Ogden, and Bruce F. Burnham, Logan, both of Utah, assignors to Nippon Petrochemicals Company, Ltd., Tokyo, Japan

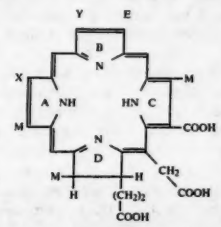
Continuation-in-part of Ser. No. 728,786, Apr. 30, 1985, abandoned. This application May 12, 1989, Ser. No. 351,770

The portion of the term of this patent subsequent to Sep. 15, 2004, has been disclaimed.

Int. Cl.[5] A61N *1/30*

U.S. Cl. 604—20 **35 Claims**

1. A pharmaceutical composition for the detection of mammalian tumors which comprises a tumor detecting effective amount of a light-sensitive tetrapyrrole compound of the formula:



or pharmaceutically acceptable salt thereof wherein

X = H, vinyl, ethyl, acetyl or formyl;

Y = methyl, formyl or $\begin{cases} H \\ methyl; \end{cases}$

M = methyl; and

E = ethyl or $\begin{cases} H \\ ethyl \end{cases}$

and a pharmaceutical carrier therefor, wherein said compound is capable of being activated by light of sufficient wavelength to emit fluorescence thereof.

5,066,275

Patent Not Issued For This Number

5,066,276

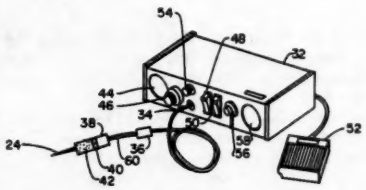
METHOD AND APPARATUS FOR INJECTING VISCOUS FLUID INTO THE EYE TO LIFT PRE-RETINAL AND POST-RETINAL MEMBRANE WITH LINEAR PRESSURE CONTROL

Carl C. T. Wang, Oakland, Calif., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 209,503, Jun. 21, 1988. This application Jun. 9, 1989, Ser. No. 363,983

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—51 **12 Claims**



1. An apparatus for injecting viscous material into an eye in the spaces between the retina and a proliferate disease membrane comprising:

an injection device having a pneumatic output and a control transducer, said injection device controlling the pressure of pressurized gas having a pneumatic pressure at said pneumatic output based on the position of said control transducer;

a pneumatic tube coupled to said pneumatic output;

a sterile filter coupled to said pneumatic output by said pneumatic tube and having a filter output; and

a sterile syringe pneumatically coupled to said filter output, said syringe having a sterile passageway formed therein with a sterile piston dividing said sterile passageway into at least first and second separate passageways with a sterile hollow needle in fluid communication with said first passageway, said pressurized gas in fluid communication with said second passageway, said syringe storing in said first passageway a sterile viscous material.

5,066,277

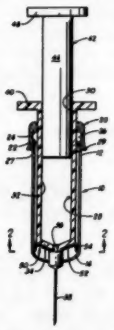
PROTECTIVE SYSTEM FOR SAFE DISPOSITION OF A HYPODERMIC SYRINGE DEVICE

Michael W. Carrell, and Stephen H. Gericke, both of Oklahoma City, Okla., assignors to Safe Medical Devices, Inc., Moore, Okla.

Continuation of Ser. No. 550,328, Jul. 9, 1990. This application Feb. 8, 1991, Ser. No. 652,521

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **7 Claims**



1. A protective assembly for preventing contact with the needle of a needle-carrying syringe used to perform hypodermic injections or to withdraw body fluids into the syringe comprising:

elongated tubular protective sheath means including a tubular sheath having a first open end and having a second end defining an opening therethrough;

a syringe device adapted for attachment of a hypodermic needle thereto, said syringe device comprising:

a hollow cylindrical barrel extending through the first open end of said tubular sheath and slidably mounted coaxially within said sheath for relative axial movement between the barrel and said sheath, said hollow cylindrical barrel including:

an open, plunger-receiving first end; and

a second end portion having a tubular tip of reduced diameter relative to the diameter of the open, first end of said barrel, said second end portion of said barrel being located at least partially within said sheath, and said first end of said barrel being located outside of said sheath and spaced from said first open end of said sheath;

a movable plunger projecting into the open, first end of said cylindrical barrel and fitting slidably within said barrel to function as a piston suitable for ejecting a fluid from said barrel through said tubular tip, or drawing a fluid through said tip into said barrel for sample taking purposes;

locking means on the outer side of said barrel and around said tubular tip for cooperatively interlocking with said tubular sheath in a retracted position of the barrel in which said tubular tip is withdrawn within said sheath, and said barrel has been moved relatively from said second end of said sheath means toward said first open end thereof, said locking means slidably engaging said tubular sheath for slidably guiding the relative movement between said sheath and said barrel, said locking means on the outer side of said barrel and around said tip comprising:

a plurality of radially deformable resilient fingers carried on said barrel at circumferentially spaced intervals

around the outer periphery of the barrel, said fingers bearing resiliently against the inner surface of said sheath and being configured to facilitate reciprocating sliding movement of said barrel in said sheath by bearing against the interior of said tubular sheath, each of said radially deformable resilient fingers comprising a protuberant male locking end portion; and

means on the tubular sheath adjacent its open end for interlocking with the resilient fingers of said locking means on the outer side of said barrel when said barrel is moved upwardly in said sheath to said retracted position, said interlocking means on said tubular sheath comprising at least one female opening for receiving the male locking end portion of at least one of said resilient fingers of said locking means.

5,066,278

IMPLANTABLE INJECTION BODY

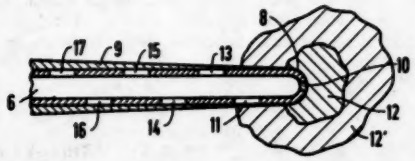
Jakub Hirschberg, Taeby, and Bengt Svensson, Järfalla, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 6, 1990, Ser. No. 562,696

Claims priority, application European Pat. Off., Aug. 9, 1989, 89114770.4

Int. Cl.[5] A61M *5/14*

U.S. Cl. 604—256 **26 Claims**



1. An implantable injection body for long-term time dependent injection of a medication into a living being, the medication being stored in an implantable dosing device and operatively supplied to the injection body via a suitable pump arrangement, comprising:

two or more discharge openings in said injection body through which the medication is supplied into said living body; and

a dissolvable tissue-compatible seal material operatively initially sealing at least some of said discharge openings such that as said seal material dissolves, these initially sealed discharge openings become unsealed at different times.

5,066,279

PROTECTIVE SHEATH FOR HYPODERMIC NEEDLES

Donald G. Russell, 86 Windsor Rd., Kensington, Conn. 06037

Filed Jun. 4, 1990, Ser. No. 532,456

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **17 Claims**

1. A protective sheath for a hypodermic needle comprising:

a tubular sleeve having a first longitudinal end with an opening for receiving a hypodermic needle and a second longitudinal end opposite the first, the length of the sleeve between the first and second longitudinal ends being greater than the length of a hypodermic needle to be encased by the sheath, the tubular sleeve having a first relatively rigid tube section adjacent the first longitudinal end of the sleeve, a second relatively rigid tube section adjacent the second longitudinal end of the sleeve and an intermediate tube section joining the first and second tube sections, the intermediate tube section being made flexible by a plurality of circumferentially extending pleats to allow the first and second tube sections to be bent out of axial alignment with one another along with an encased hypodermic needle to decommission the needle within the protective sheath.

5,066,280

SYRINGES

Philip W. Braithwaite, Strensham, England, assignor to Technosystem Limited, Liverpool, United Kingdom

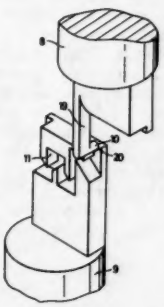
PCT No. PCT/GB88/00803, § 371 Date May 17, 1990, § 102(e) Date May 17, 1990, PCT Pub. No. WO89/02759, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 30, 1988, Ser. No. 469,418

Claims priority, application United Kingdom, Sep. 30, 1987, 8722915

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **4 Claims**



1. A syringe comprising a barrel housing both a piston and a plunger for moving the piston to enable a liquid dose to be drawn into and ejected from a portion of the barrel, a coupling member interconnecting the piston and the plunger, and decoupling linkages interconnecting the coupling member to at least one of the piston and the plunger such that the plunger is operatively disconnected from the piston after the plunger has been retracted and subsequently depressed, a flange on the piston or the coupling member, and latches on the inner wall of the barrel which interact with the flange so that the flange is able to pass the latches before disconnection of the or each of the coupling linkages but is unable to pass the latches upon attempted withdrawal of the plunger after such disconnection.

5,066,281

DISPOSABLE SYRINGE APPARATUS WITH RETRACTABLE NEEDLE, LOCKING DEVICE AND CAP DEVICE

Deborah G. C. Stevenson-Michener, 226 E. Flag Swamp Rd., Southbury, Conn. 06488

Filed Mar. 26, 1990, Ser. No. 498,957

Int. Cl.[5] A61M *5/50*

U.S. Cl. 604—110 **6 Claims**

1. A syringe apparatus which comprises:

a) a substantially cylindrical hollow barrel portion herein described as cylinder having a substantially closed distal end and an open proximal end and having flange shoulder portions extending outwardly form the cylinder surface at the proximal end as a gripping means;

b) a body entering conduit at least partially contained within said hollow cylinder portion and at times partially extruding therefrom;

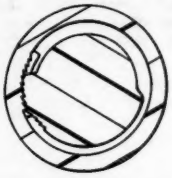
c) a means for the frictional sealing at the distal end of the

cylinder so that the distal end remains closed after retraction of the body entering conduit;

d) a piston assembly movable reciprocally and axially through said cylinder;

e) means for detachably connecting the proximal end of the body entering conduit to said piston assembly distal end so that when said conduit and said assembly are connected said piston moves in unison with said body entering conduit;

f) means for detachably connecting the distal end of the piston assembly to said proximal end of the body entering conduit so that when said conduit and said assembly are connected said conduit moves in unison with said piston;



g) means for anchoring said detachable piston connecting means at said piston assembly distal end;

h) means for locking the piston assembly and the attached body entering conduit within the cylinder following retraction of the body entering conduit within the cylinder by reciprocal and axial movement thereof, said means comprising a tapering spiral ribbed cam on the piston;

i) said means for locking the piston assembly and the detachably connected body entering conduit within the cylinder following retraction of the body entering conduit within the cylinder further comprising ribbed retainers on the interior of the cylinder allowing for only one way, one time use of the syringe apparatus when engaged with said cam.

5,066,282

POSITIVE DISPLACEMENT PISTON DRIVEN BLOOD PUMP

Bandula Wijay, Webster, and Paolo Angelini, Houston, both of Tex., assignors to Leocor, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 100,363, Sep. 23, 1987, Pat. No. 4,921,483, which is a continuation-in-part of Ser. No. 811,162, Dec. 19, 1985, abandoned, said Ser. No. 100,363, is a continuation-in-part of Ser. No. 303,544, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 303,550, Jan. 27, 1989, abandoned. This application May 4, 1989, Ser. No. 347,406

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—152 **25 Claims**

13. A pumping source for pumping blood comprising:

a pump body;

means on said body for elevating pressure of blood passing through said body; and

means in flow communication with said body for dampening potation of the blood as it emerges from said pump body, said pulsation dampening means further comprising:

a housing defining an accumulator cavity therein; and

a membrane covering said accumulator cavity, thereby isolating blood passing through said body from said cavity;

at least one inlet valve;

at least one outlet valve;

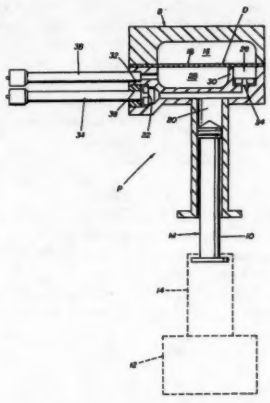
a least one pressurization chamber defining a volume in fluid communication with both said inlet and outlet valves; and

means for varying the volume of said pressurization chamber;

said outlet valve is in flow communication with an exit port in said body;

said membrane covering said exit port when said outlet valve is in the closed position, said accumulator cavity disposed on the opposite side of said membrane from said exit port;

said body further comprising an exit chamber cavity defined therein, said exit chamber cavity spaced apart from said exit port;



said exit chamber cavity is in flow communication with said exit port when said outlet valve is open and said membrane flexes, thereby reducing the volume of said accumulator cavity.

5,066,283

DEVICE FOR THE WITHDRAWAL AND STORAGE OF INDIVIDUAL FLUID FRACTIONS LATHERED AT GIVEN INTERVALS

Falko Skrabal, Graz, Austria, assignor to AVL AG, Schaffhausen, Switzerland

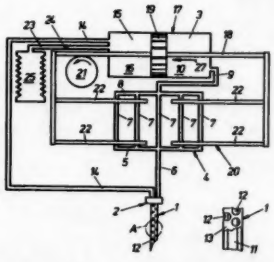
PCT No. PCT/AT88/00051, § 371 Date Mar. 8, 1989, § 102(e) Date Mar. 8, 1989, PCT Pub. No. WO89/00397, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 11, 1988, Ser. No. 348,488

Claims priority, application Austria, Jul. 9, 1987, 1732/87

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—152 **18 Claims**



1. A device for withdrawing body fluids, such as blood, urine, tissue fluid, comprising a withdrawal unit connected to a suction unit and a storage system which is situated between said suction unit and said withdrawal unit, said storage system comprises separable individual areas for respectively receiving and holding fractions of said body fluid gathered at certain sequential intervals, permitting said fluid fractions to be clearly identified with regard to their time of withdrawal, wherein said withdrawal unit is provided with an ingoing line for a liquid to be introduced into the body and an outgoing line for

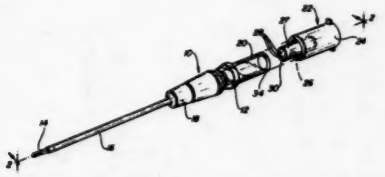
said body fluid to be gathered, and wherein said ingoing line is connected to a pressure unit.

5,066,284

VENT FOR FLASHBACK PLUG

Steve H. Mersch, Germantown; David E. Spielvogel, Springboro, and Charles W. Daugherty, Xenia, all of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed May 11, 1989, Ser. No. 350,960
Int. Cl.[5] A61M 5/178
U.S. Cl. 604—168 14 Claims



1. A plug for use in plugging the proximal end of a transparent flashback chamber in an intravenous needle assembly, said plug for providing air venting of said flashback chamber, said plug comprising

(a) an integral one-piece molded hollow body defining an air vent passage;

(b) a hollow neck portion positioned on the distal end of said body, said neck portion being integral with said body portion;

(c) a front face on the distal end of said neck portion;

(d) said front face being thin-walled and of the same thickness throughout;

(e) a plurality of vent holes in said front face;

(f) said vent holes being laser drilled vent holes;

(g) at least said thin-walled front face being comprised of a thermoplastic material having sufficient laser absorption characteristics to vaporize under the effect of a laser beam; and

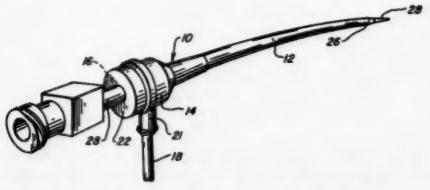
(h) said thin-walled front face having in percent be weight an amount of an additive effective for optimizing said vaporization.

5,066,285

CATHETER INTRODUCER SHEATH MADE OF EXPANDED POLYTETRAFLUOROETHYLENE

Richard A. Hillstead, Miramar, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jan. 26, 1990, Ser. No. 470,716
Int. Cl.[5] A61M 5/178
U.S. Cl. 604—164 7 Claims



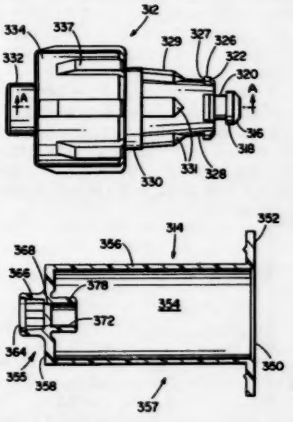
1. A catheter introducer adapted to be temporarily introduced into a patient's blood vessel, said catheter introducer comprising a hub containing a hemostasis valve and a tubular sheath substantially longer than said hub, said sheath being adapted to enclose a dilator which has an end which extends forward of the end of the tubular sheath when the dilator is inserted within the catheter introducer for introduction of the dilator and the tubular sheath into a patient's blood vessel, with the dilator thereafter being removed from the introducer to enable the introducer to receive a catheter, said elongated, tubular sheath being made of an expanded, fibrous plastic, whereby said sheath is highly flexible and non-kinking, but with relatively high hoop strength.

5,066,286

SAFETY MULTIPLE SAMPLE LUER ADAPTER ASSEMBLY

Dana W. Ryan, Franklin, Tenn., assignor to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 520,239, May 7, 1989. This application Nov. 8, 1990, Ser. No. 610,538
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—240 20 Claims



1. A safety luer adapter assembly for coupling a fluid conduit means to a fluid collection means, said safety luer adapter assembly comprising:

a) a male connector having hollow first and second end portions, said hollow first and second end portions defining a throughbore in fluid communication with said fluid conduit means, said first end portion having first locking means, said male connector having first anti-rotational means, and said second end portion having coupling means for coupling to the fluid conduit means; and

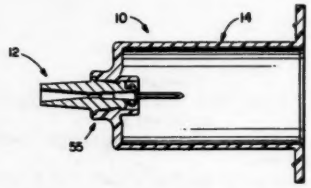
b) a hollow rear blood tube holder with an outer wall defining a receiving cylinder with an open rear end for receiving the fluid collection means, and a front end having an opening therein for accepting at least a portion of said hollow first end portion of said male connector, said front end of said hollow rear blood tube holder having second locking means, and said hollow rear blood tube holder having second anti-rotational means,

wherein in assembling said safety luer adapter assembly said first and second locking means are brought into permanent locking engagement, and said first and second anti-rotational means are brought into engagement to prevent rotation of said male connector relative to said hollow rear blood tube holder.

5,066,287
SAFETY MULTIPLE SAMPLE REAR ADAPTER ASSEMBLY

Dana W. Ryan, Franklin, Tenn., assignor to Ryan Medical, Inc., Brentwood, Tenn.

Continuation-in-part of Ser. No. 224,920, Jul. 27, 1988, Pat. No. 4,923,445. This application May 7, 1990, Ser. No. 520,239
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—240 11 Claims



1. A safety rear adapter assembly for coupling a fluid conduit means to a fluid collection means, said safety rear adapter assembly comprising:

a) a male connector having hollow first and second end portions and a hollow needle, said hollow first and second end portions defining a throughbore in fluid communication with said hollow needle, said first end portion having on its outer surface a first locking means, and said second end portion having coupling means for coupling to the fluid conduit means, and said outer surface of said first end portion of said male connector comprising a first ramp of increasing diameter as it extends from said first end portion toward said second end portion, and a shoulder of relatively constant outer diameter, said first ramp terminating in a first end of said shoulder, said shoulder having a second end terminating in portion of reduced diameter relative thereto; and

b) a hollow rear blood tube holder with an outer wall defining a receiving cylinder with an open rear end for receiving the fluid collection means, and a front end having an opening therein for accepting at least a portion of said hollow first end portion of said male connector, said front end of said hollow rear blood tube holder having on its inner surface a second locking means, said inner surface of said front end of said hollow rear blood tube holder comprising a second ramp of decreasing inner diameter as it extends from said front end to said open rear end, said second ramp terminating in a chamber of inner diameter at least as large as said outer diameter of said shoulder, and said shoulder being of larger outer diameter than the inner diameter of said second ramp termination such that said termination of said second ramp and said shoulder form abutting locking surfaces,

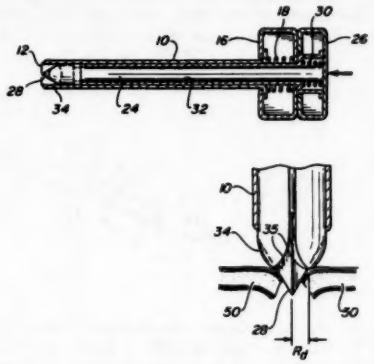
wherein in assembling said safety rear adapter assembly said first and second locking means are brought into permanent locking engagement.

5,066,288
SAFETY TROCAR

Jose C. Deniega, Flemington, and Stephen J. Failla, Chester, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 27, 1989, Ser. No. 371,953
Claims priority, application United Kingdom, Jul. 6, 1988, 8816033
Int. Cl.[5] A61M *5/46, 25/08, 25/01, 25/06*
U.S. Cl. 604—274 6 Claims

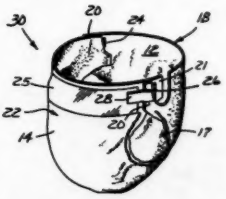
1. A trocar including a trocar tube having a proximal and a distal end, an obturator having a perforating tip and extendable through the tube to perforate tissue at the distal end of the tube, said perforating tip having a three-sided pyramidal shape, and containing three cutting edges, and further including a safety shield extendable to shield the tip of the obturator, said safety shield exhibiting a rounded distal end with a slot for passage of said obturator tip therethorugh, said slot bounded by three distally extending semicircular lobes formed on the distal end of said shield, such that the proximal ends of said lobes oppose each other on either side of said cutting edges while said obturator tip is extended through said slot, and said slot generally conforming to the geometry of said obturator tip such that each of said semicircular lobes fit against said obturator tip while entering the perforation created by the tip to spread the perforation.



5,066,289
RELEASE TREATED NON-WOVEN FASTENING TAPE PROTECTOR

Stephen P. Polski, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 9, 1990, Ser. No. 506,912
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—389 8 Claims



7. A diaper comprising an outer shell, a liquid permeable non-woven topsheet which contacts the wearer, a non-woven release tab attached to said non-woven topsheet at a corner of said non-woven topsheet, and a diaper fastening tab adjacent the non-woven release tab to permit engagement therewith, said non-woven release tab comprising a non-woven substrate capable of engaging a mechanical fastener, which substrate has been treated with a release agent which resists permanent attachment to a pressure sensitive adhesive such as is used on a diaper fastening tab wherein the non-woven release tab is relatively soft and non-irritating to the wearer.

5,066,290

STERILIZABLE MULTI-LAYER PLASTIC MATERIALS FOR MEDICAL CONTAINERS AND THE LIKE

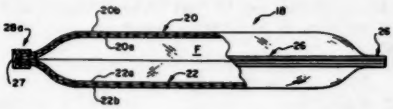
Paul E. Measells, Vernon Hills; William D. Johnston, Buffalo Grove; Peter C. Kwong, McHenry; Dean G. Laurin, Lake Zurich, and Leonard F. Czuba, Lombard, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 143,295, Jan. 7, 1988, Pat. No. 4,892,604, which is a continuation of Ser. No. 59,132, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 827,847, Feb. 7, 1986, abandoned. This application Sep. 27, 1989, Ser. No. 413,500

The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.

Int. Cl.[5] B23B *31/26*

U.S. Cl. 604—408 **23 Claims**



1. A heat sterilizable stress-free container made in accordance with the method comprising the steps of:

forming first and second film members, each having at least two integral layers, the first of the layers formed of a material which is cross-linkable and free or essentially free of leachable plasticizers and which has a heat distortion temperature at or below 110° C., the first layer material being selectively cross-linkable to obtain the desired resistance to distortion at heat sterilization temperatures, the second of the layers formed of a material which, when compared to the first layer material, is not cross-linkable and which has a heat distortion temperature above 110° C.;

positioning the first and second film members in overlapping relationship with corresponding first layers of each adjacent one another so as to form inner surfaces of the container;

melting a peripheral region of the overlapping, adjacent first layers of the container using heat sealing elements without pre-stressing said film members to form a peripheral seal between the inner first layers of the container;

irradiating the container so as to cross-link the first layers to obtain the desired resistance to melting; and

sterilizing the container by exposure to heat at or above 110° C. without pre-stressing the material, to form a non-stressed, non-heat shrinkable container.

5,066,291

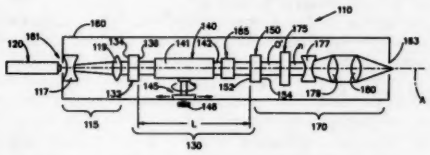
SOLID-STATE LASER FREQUENCY CONVERSION SYSTEM

Bob W. Stewart, Cincinnati, Ohio, assignor to Cincinnati Sub-Zero Products, Inc., Cincinnati, Ohio

Filed Apr. 25, 1990, Ser. No. 514,198

Int. Cl.[5] A61B *17/00;* **H03F** *7/00*

U.S. Cl. 606—3 **32 Claims**



1. A conversion system for medical applications wherein laser radiation at a predetermined wavelength from a single laser device is converted for simultaneous application of laser light energy at a plurality of predetermined wavelengths, said conversion system comprising:

means for receiving laser radiation at a single predetermined source wavelength from a laser device;

means for focusing received laser radiation at a predetermined pump wavelength into a conversion medium, said pump wavelength being in a range of wavelengths closely matched to a light absorption peak of one of either water or Hemoglobin, for medical use;

a conversion medium prepared for efficient conversion of a portion of said focused radiation at said pump wavelength to a predetermined medically usable signal wavelength, said signal wavelength being in a range of wavelengths closely matched to the other of said water or Hemoglobin light absorption peaks; and

means for coaxially transmitting laser radiation at both said pump and signal wavelengths from said conversion system for simultaneous use in a medical procedure.

5,066,292

CATHETER SYSTEM FOR VESSEL RECANALIZATION IN THE HUMAN BODY

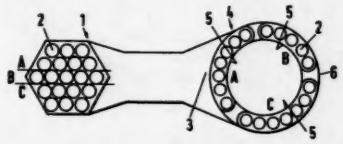
Gerhard Müller; Hasan Kar; Klaus Dörschel, all of Berlin, and Karl-Heinz Schönborn, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Mar. 19, 1990, Ser. No. 494,743

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 8903333[U]

Int. Cl.[5] A61M *29/02*

U.S. Cl. 606—7 **4 Claims**



1. A catheter system for the transmission of laser radiation comprising:

a catheter having a proximate end for coupling to a source of laser light and a distal end for emitting the laser light, the catheter having a wall with an inner surface defining a cavity;

a ring of lightguides extending through the cavity adjacent the inner surface of the catheter wall, the ring of lightguides being configured in separate connected groups with the groups connected by elastically extendable material; and

means adjacent the distal end and disposed within the ring of lightguides for selectively outwardly expanding and contracting the diameter of the entire ring of lightguides or selectively the individual groups of lightguides, the lightguides being bunched at the proximate end of the catheter for alignment with the source of laser light.

5,066,293

LIGHT AMPLIFIER AND METHOD OF PHOTOTHEMOLYSIS

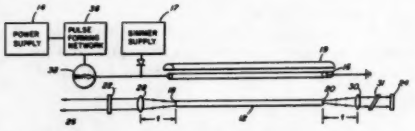
Horace Furumoto, Wellesley, Mass., assignor to Candela Laser Corporation, Wayland, Mass.

Continuation of Ser. No. 939,262, Dec. 8, 1986, Pat. No. 4,829,262, which is a continuation of Ser. No. 664,525, Oct. 25, 1984, abandoned. This application Mar. 10, 1989, Ser. No. 322,618

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] A61N *5/06*

U.S. Cl. 606—9 9 Claims



1. A method of phothermolysis of biological tissue comprising:

energizing a liquid dye medium in a dye cell including an aperture at each end thereof to an energy level at which the medium has net optical gain thereby producing an output beam from said dye cell;

from each end of the cell returning into the cell substantially all light other than the output beam, within a wavelength band emanating from the cell, such that the light traverses the cell with internal reflections off cell walls and the cell amplifies the light, the light being returned including other than spatially coherent light traveling coaxially in the cell, the output beam being of at least one hundred microsecond duration and at least one-tenth joule; and

illuminating the biological tissue with the output beam from the cell.

5,066,294

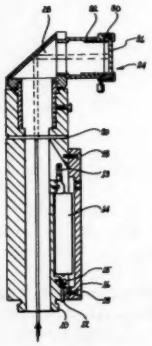
PERFORMANCE TESTER APPARATUS FOR A SURGICAL LASER SYSTEM AND METHOD THEREFOR

Ioan Cosmescu, 14449 North St., Phoenix, Ariz. 85022

Filed May 22, 1990, Ser. No. 527,140

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—11 14 Claims



1. An apparatus for testing the performance of a visible laser aiming beam and invisible laser cutting beam output of a surgical laser system comprising, in combination:

target assembly means for attachment to said visible and invisible beam output;

target means removably coupled to said target assembly means for measuring the performance attributes of said visible and invisible beam output, said target means further comprises target configuration means for indicating a precise location of impingement of said visible and invisible beam output on said target means;

light means coupled to said target assembly means for providing a source of light within said target assembly means to illuminate said location; and

eye viewing means coupled to said target assembly means for permitting visual observation of said location of said visible and invisible beam output; said target configuration means comprises a calibrated target to permit evaluation of the transverse electromagnetic mode and beam diameter of said invisible laser cutting beam and the location of said invisible laser cutting beam with respect to said visible laser aiming beam.

5,066,295

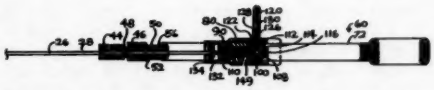
ROTATABLE SURGICAL SNARE

Mark Kozak, Euclid, and Michael Nichols, Mentor, both of Ohio, assignors to Mill-Rose Laboratories, Inc., Mentor, Ohio

Filed May 13, 1986, Ser. No. 862,683

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—47 15 Claims



1. In an endoscopic snare having a sheath, an electrically conducting cable with a snare at a distal end movable into and out of the sheath and a manual operating assembly attached to the sheath and to a proximal end of the cable, the improvement wherein the manual operating assembly comprises an elongated holder having a body portion, and a cable actuator, said body portion having a central longitudinal recess open through two opposite sides to define a pair of parallel guides upon which the actuator is slidably mounted, said pair of parallel guides each having an interiorly facing arcuate surface, said cable actuator having an electrically conducting snare-rotating member between said parallel guides, said snare-rotating member partially encircled by the interiorly facing arcuate surfaces of said parallel guides, said snare-rotating member and the proximal end of the cable each having means cooperating to form a quick disconnect connection wholly within said snare-rotating member, and said elongated holder, snare-rotating member and cable being constructed and arranged to have a common longitudinal axis.

5,066,296

APPARATUS FOR TREATING A FRACTURE

Michael W. Chapman, Sacramento, Calif.; Dana C. Mears, Pittsburgh, Pa., and Charles C. Edwards, Baltimore, Md., assignors to Pfizer Hopsital Products Group, Inc., New York, N.Y.

Filed Feb. 2, 1989, Ser. No. 305,840

Int. Cl.[5] A61B *17/58*

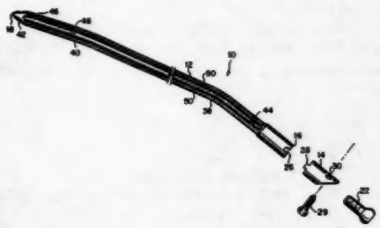
U.S. Cl. 606—64 25 Claims

1. A bone implant comprising:

an implant body member for insertion into a bone cavity, said body member having a proximal end and a distal end;

an implant tab member having proximal and distal ends and at least one bone fixation aperture to allow for passage of a bone fixation screw for fastening said implant tab member to the bone, wherein the length of said tab member from said distal end to said proximal end varies at points around the periphery of said tab member to define a portion of shorter length as compared to other portions around the periphery and said least one bone fixation aperture is located to be accessible to insertion of said

fixation screw by passing said screw proximally past said shorter length portion; and



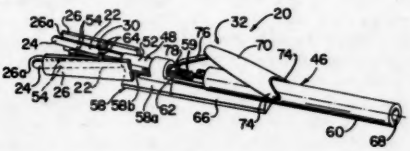
means for selectively removably coupling said implant tab member distal end to said proximal end of said implant body member.

5,066,297

INTRAOCULAR LENS INSERTION DEVICE

J. Stuart Cumming, 1211 W. LaPalma Ave., #201, Anaheim, Calif. 92801

Division of Ser. No. 298,925, Jan. 23, 1989, Pat. No. 4,976,716.
This application Jul. 30, 1990, Ser. No. 560,094
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—107 6 Claims



1. A surgical aid for holding a surgical instrument for inserting a foldable intraocular lens into a patient's eye thru a corneal incision, said instrument having an elongate body and a pair of slender lens gripping fingers at one end of the body which are pivotally movable away from one another to open positions wherein the fingers are disposed to straddle a foldable intraocular lens in its normal unfolded configuration and toward one another to closed positions to fold the lens and then grip the folded lens, said surgical aid comprising:

an instrument holder including a tubular body, instrument finger backup members at one end of said holder body, and means mounting said backup members on said holder body at opposite sides thereof for movement laterally of the holder body away from one another to normal open positions wherein the backup members are spaced to straddle the open instrument lens gripping fingers and toward one another from said normal positions to closed positions;

means for positively securing said holder backup members in their closed positions;

said holder having a normal pre-use configuration in which said backup members occupy their normal open positions and the holder is conditioned to receive said instrument in an initial position wherein (a) the instrument body extends longitudinally through said holder body, (b) the instrument lens gripping fingers occupy their open positions between the open backup members, and (c) said backup members are movable toward one another from their normal open positions to their closed positions to close the instrument lens gripping fingers and hold the lens gripping fingers in their closed positions; and

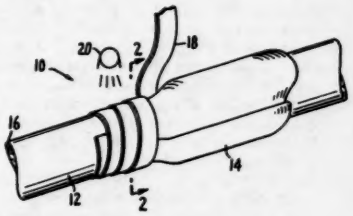
actuating means movably mounted on said holder body for engaging the body of the instrument when positioned in said holder and moving the instrument longitudinally relative to said holder to extend the closed instrument lens gripping fingers longitudinally relative to the closed holder backup members.

5,066,298

ARTICLE AND METHOD OF SHEATHING ANGIOPLASTY BALLOONS

Robert L. Hess, Portola Valley, Calif., assignor to Progressive Angioplasty Systems, Inc., Menlo Park, Calif.

Filed Nov. 30, 1989, Ser. No. 443,393
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—194 12 Claims



12. A catheter comprising:

a body portion;

a balloon portion, said balloon portion being larger in diameter than said body portion; and

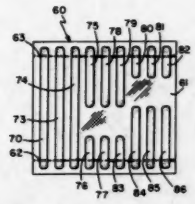
a circumferential, generally helical wrap over said balloon portion, said wrap diametrically compressing said balloon portion radially inwardly, said balloon portion being set in said compressed diameter, said wrap sheathing said catheter during storage, said balloon portion being set and remaining substantially diametrically compressed when said wrap is removed for the purpose of insertion into the body.

5,066,299

QUICK USE SUTURE PACKAGE

Godfrey Bellingham, Lake Elmo, Minn., assignor to Bellingham Medical, Inc., Lake Elmo, Minn.

Filed Jun. 29, 1990, Ser. No. 545,845
Int. Cl.[5] A61B *17/06*
U.S. Cl. 606—213 8 Claims



1. A package of wound closure strips to quickly enable a user to select the correct length would closure strip by visual inspection of the wound closure strips comprising:

a single backing sheet for supporting multiple wound closure strips in a side by side unpackaged condition, said backing sheet having a surface for releasing an article adhesively fastened thereto, said backing sheet having a generally rectangular shape with a first end and a second end, said backing sheet including a first line of weakness extending along said first end and a second line of weakness extending along said second end, said first line of weakness permitting a user to tear away said backing sheet along said first line of weakness and said second line of weakness permitting a user to tear away said backing sheet along said second line of weakness;

a first wound closure strip having a first side, a first end, and

a second end, said first wound closure strip having a length L, said first wound closure strip having an adhesive coating extending over said first side of said first wound closure strip and releasably mounting said first wound closure strip to said backing sheet with at least one end of said first wound closure strip extending beyond said first line of weakness to permit the user to tear away said backing sheet along said first line of weakness to expose said first end of said first wound closure strip to permit the user to remove said first wound closure strip from said backing sheet;

a second wound closure strip having a first side, a first end, and a second end, said second wound closure strip having a length L_2, said second wound closure strip having an adhesive coating extending over said first side of said second wound closure strip and releasably mounting said second wound closure strip to said backing sheet with at least one end of said second wound closure strip extending beyond said first line of weakness to permit the user to tear away said backing sheet along said first line of weakness to expose said first end of said second wound closure strip to permit the user to remove said second wound closure strip from said backing sheet; and

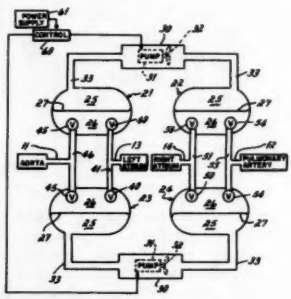
a third wound closure strip having a first side, a first end, and a second end, said third wound closure strip having a length L_3, said third wound closure strip having an adhesive coating extending over said first side of said third wound closure strip and releasably mounting said third wound closure strip to said backing sheet with at least one end of said third wound closure strip extending beyond said second line of weakness to permit the user to tear away said backing sheet along said second line of weakness to expose said first end of said third wound closure strip to permit the user to remove said third wound closure strip from said backing sheet where the length L_2 of said second wound closure strip and the length L_3 of said third wound clousre strip is less than the length L of said first suture strip.

5,066,300

TWIN REPLACEMENT HEART

Milton S. Isaacson, Dayton; Donald E. Holmes, Greenville, and Anthony P. Lioi, Dayton, all of Ohio, assignors to Nu-Tech Industries, Inc., Dayton, Ohio

Filed May 2, 1988, Ser. No. 188,906
Int. Cl.[5] A61M *1/10*
U.S. Cl. 623—3 **3 Claims**



1. A replacement heart comprising:

a housing having left and right atrial inlets and left and right ventricular outlets,

means dividing said housing into two sets of two chambers, diaphragms dividing each chamber into a blood side and a pump side,

one chamber of each set connected on its blood side to said left atrial inlet and said left ventricular outlet,

the other chamber of each set connected on its blood side to said right atrial inlet and right ventricular outlet,

each set of chambers having a pump housing and a reversible dc motor and impeller in each housing, conduit connecting said housing to the pump side of each said chamber in each set,

a hydraulic fluid in said pump housing, conduit and pump side of each set,

and a control system including a power supply for simultaneously operating said motors and reversing them at a rate corresponding to the rate needed to sustain a patient's activity.

5,066,301

VARIABLE FOCUS LENS

Robert G. Wiley, 4545 Brookside Rd., Toledo, Ohio 43615

Filed Oct. 9, 1990, Ser. No. 594,086
Int. Cl.[5] A61F *2/16*; G02B *26/00*; G02C *7/04, 7/02*
U.S. Cl. 623—6 **20 Claims**

1. A passive stable variable focus intraocular lens apparatus, for implantation into an eye, comprising:

a transparent, generally circular envelope;

a transparent gel having a relatively high resistance to flow encased in said envelope; and

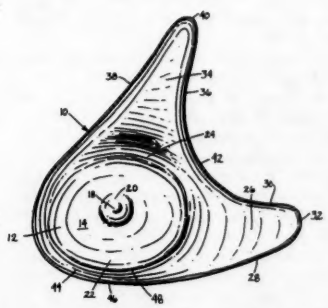
a plurality of light refracting particles suspended in a predetermined orientation in said gel, said particles being responsive to an external force for changing to a new orientation of said particles with respect to said envelope for selectively adjusting characteristics of said lens apparatus including the characteristics of power and astigmatism correction, whereby upon removal of the external force, said particles remain in said new orientation within said gel.

5,066,302

BREAST PROSTHESIS

Jean E. Rice, 1409 W. Yakima Ave., Yakima, Wash. 98902

Filed Apr. 25, 1990, Ser. No. 514,164
Int. Cl.[5] A61F *2/52*
U.S. Cl. 623—7 **9 Claims**

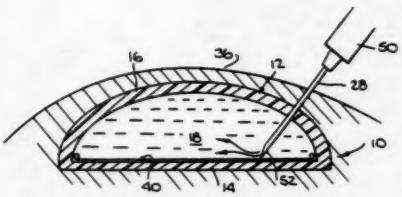


1. A solid breast prosthesis made entirely of a silicon compound, and comprising:

a pliable molded form of a complete female breast, said form

having an inferior margin forming the edge of the lowermost portion;
an axillary supplement extending laterally from the form;
a clavicular supplement extending generally upwards from the form; and
a retaining band below the inferior margin of the form.

5,066,303
SELF-SEALING TISSUE EXPANDER AND METHOD
Jeffrey E. Bark, Racine; Donald V. Hillegass, Franksville, and Eric J. Woodruff, Racine, all of Wis., assignors to Medical Engineering Corporation, Racine, Wis.
Filed Aug. 7, 1989, Ser. No. 390,267
Int. Cl.[5] A61F 2/12
U.S. Cl. 623—8 **39 Claims**



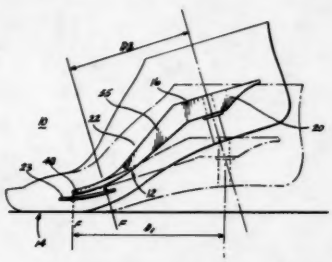
1. A tissue expander for implantation in a patient to promote tissue growth comprising, a closed flexible shell defining an internal chamber, said shell being substantially collapsible when said chamber is empty and expandible upon infusion of fluid into said chamber, said shell including a shell wall formed of interior and exterior shell layers of relatively high durometer elastomeric material which is substantially nonflowable, and at least one median layer intermediate said interior and exterior shell layers of relatively low durometer material which is flowable for self-sealing a needle hole formed in said interior and exterior layers of said shell wall by a needle of predetermined cross section which penetrates the interior and exterior layers of said shell wall into said chamber to inject or withdraw fluid, the durometer of said median layer material being selected to enable said median layer material to flow into and seal said needle hole in said interior and exterior shell layers when said needle is withdrawn from said shell wall.

5,066,304
PROSTHETIC INTERPOSITIONAL DEVICE/COUPLER
Roy D. Crowninshield, Warsaw, and Roy Y. Hori, both of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 325,799, Mar. 20, 1989, Pat. No. 5,015,257.
This application Feb. 1, 1991, Ser. No. 649,094
Int. Cl.[5] A61F 2/32
U.S. Cl. 623—22 **3 Claims**

1. A set of implant components comprising a plurality of couplers wherein the plurality of couplers are available in a plurality of differing lengths to enable the desired length coupler to be selected for interpositioned engagement between a femoral prosthesis head and a neck of a femoral prosthesis stem to provide a desired distance therebetween, and wherein each coupler comprises a hollow sleeve having a first end and a second end and wherein the first end of each coupler in the set is open for fitting over the neck of the femoral stem, and wherein the second end of at least one of the couplers in the set includes an end wall generally transverse to a longitudinal axis of said coupler and wherein the second end of at least one other of the couplers is open without any end wall, and wherein said at least one of the couplers including said end wall has a greater length than said at least one other of the couplers having the open second end, and wherein all couplers in the set having an open second end are shorter than any

couplers in the set in which the second end includes an end wall.

5,066,305
PROSTHETIC FOOT HAVING A LOW PROFILE CANTILEVER SPRING KEEL
David G. Firth, Seattle, Wash., assignor to Model & Instrument Development Corporation, Seattle, Wash.
Filed Oct. 25, 1988, Ser. No. 262,464
Int. Cl.[5] A61F 2/66
U.S. Cl. 623—55 **26 Claims**



16. A keel for a prosthetic foot, comprising a cantilever spring member exhibiting viscoelastic properties, said cantilever spring member including:
(a) a mounting portion for connecting the keel to an upper prosthesis at a location approximating the location of the ankle joint of a human foot, the mounting portion having a forward section and a rearward section; and,
(b) a monolithic forefoot beam cantilevered extending forwardly and diagonally downwardly from the forward section of the mounting portion to the front end of the keel and at least approaching a point of the prosthetic foot corresponding the toes of a human foot, said beam being shaped and dimensioned to flex upwardly and thereby store strain energy during footfall and then with the following footrise, releasing such strain energy in the form of foot lift and thrust as the beam returns to its nominal configuration, with the location of the upward reaction force being applied to the beam during footfall progressively and continuously shifting rearward along the keel from the front of the keel to progressively decrease the distance between the location of the upward reaction force and the mounting portion and progressively increase the spring rate of the keel.

5,066,306

PROCESS FOR REMOVING PERMANGANATE STAINS FROM ARTICLES

James L. Clements, Henderson, Ky., assignor to 501 P.B. & S. Chemical Company, Inc., Henderson, Ky.

Continuation-in-part of Ser. No. 387,899, Aug. 1, 1989, Pat. No. 4,961,749. This application Jul. 31, 1990, Ser. No. 564,750

Int. Cl.[5] D06L *3/06*

U.S. Cl. 8—109 40 Claims

1. A bleaching process comprising the steps of:

(a) treating a fiber, fabric, or garment with a permanganate bleaching agent; and

(b) reducing the permanganate with a reducing composition containing sulfur dioxide and ammonia in amounts so that substantially no sulfur dioxide odor is detectable during the reduction step.

5,066,307

TEXTILE FINISHING AGENTS HAVING REDUCED FORMALDEHYDE EMISSION

Robert G. Lees, Stamford, Conn., and Edward B. Lawler, Charlotte, N.C., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 102,459, Sep. 29, 1987, abandoned. This application Mar. 18, 1991, Ser. No. 671,188

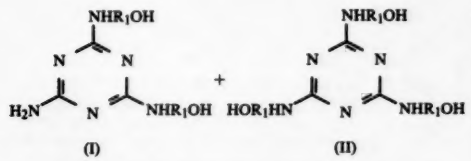
Int. Cl.[5] C08L *61/32;* D06M *13/355, 13/382*

U.S. Cl. 8—182 43 Claims

1. An amino resin composition comprising as resin forming components:

(i) from about 90 to about 50 parts by weight of a first stage amino resin; and,

(ii) from about 10 to about 50 parts by weight of a polyhydroxylalkyl melamine reactant represented by the formulae:



(I) (II)

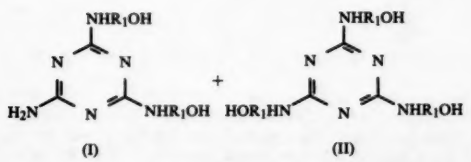
wherein the weight ratio of formula (I) to formula (II) is from about 10:90 to about 90:10, and R_1 is an alkyl group of from 2 to 8 carbor atoms.

32. A process for producing an amino resin treated textile wherein the improvement comprises:

(1) contacting a textile with an amino resin forming bath having as components;

(i) from about 90 to about 50 parts by weight of a first stage amino resin;

(ii) from about 10 to about 50 parts by weight of a polyhydroxylalkyl melamine reactant represented by the formulae:



(I) (II)

wherein the weight ratio for formula (I) to formula (II) is from about 30:70 to about 70:30 and R_1 is an alkyl group of from 2 to 8 carbon atoms;

(iii) a curing catalyst;

(iv) a liquid medium;

(2) and thereafter curing the resin forming ingredients to affix said resin to said textile.

5,066,308

END IDENTIFIER FOR MULTIDYE YARN

Ling Yeh; Hugh G. Harrelson, and Andrew M. Coons, III, all of Anderson, S.C., assignors to BASF Corporation, Parsippany, N.J.

Filed Feb. 6, 1990, Ser. No. 475,599

Int. Cl.[5] D06P *5/13*

U.S. Cl. 8—403 10 Claims

1. A method of distinguishing between two or more polyamide fibers in greige fabric, said fibers having different dye affinities, comprising the steps of adding sufficient pigment to one fiber during fiber forming to make it visible to the eye, and leaving one unpigmented fiber.

5,066,309

LIQUID METAL COMPLEX DYE PREPARATIONS, PROCESS FOR THEIR PREPARATION AND THEIR USE

Ernst Tempel, Riehen, and Pia Grimbü hler-Can, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 10, 1990, Ser. No. 550,430

Claims priority, application Switzerland, Jul. 14, 1989, 2645/89

Int. Cl.[5] C09B *67/00, 45/00*

U.S. Cl. 8—527 12 Claims

1. A stable, concentrated, aqueous colloidal or dispersed preparation of a 1:2 metal complex dye, which comprises (1) 10 to 30% by weight of a 1:2 metal complex dye, (2) 3 to 30% by weight of an anionic dispersant, (3) 1 to 15% by weight of a polyalcohol of 2 to 6 hydroxy groups and 2 to 6 carbon atoms and (4) 0 to 25% by weight of a customary formulation assistant, and water in an amount such that the sum of all the components is 100%.

5,066,310

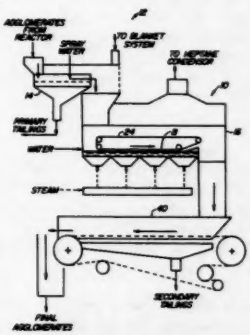
METHOD FOR RECOVERING LIGHT HYDROCARBONS FROM COAL AGGLOMERATES

Horst Huettenhain, Benicia; August D. Benz, Hillsborough, both of Calif., and John Getsoian, Ann Arbor, Mich., assignors to Bechtel Group, Inc., San Francisco, Calif. and Arcanum Corp., Ann Arbor, Mich.

Filed Aug. 13, 1990, Ser. No. 566,634

Int. Cl.[5] C10L *5/00*

U.S. Cl. 44—500 23 Claims



1. A method for recovering light hydrocarbons used as a bridging liquid from agglomerated coal particles, said method comprising:

immersing the agglomerated coal particles in water;

heating the immersed agglomerated coal particles under conditions selected to remove substantially all light hydrocarbons from said agglomerated coal particles, whereby a vapor phase containing water vapor and light hydrocarbon vapor is produced; and

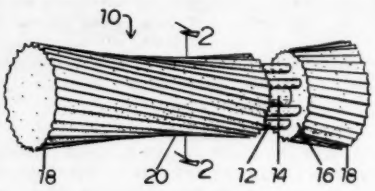
recovering the light hydrocarbons from the vapor phase.

5,066,311

FUEL PRODUCTS FROM WASTE MATERIALS

Paul D. Chalmer, 5280 Westbury Rd., Chelsea, Mich. 48118

Filed Jun. 18, 1990, Ser. No. 539,186
Int. Cl.[5] C10L 5/00
U.S. Cl. 44—535 5 Claims



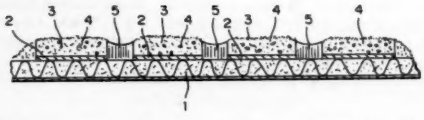
1. A fuel article comprising: a combustible material having a covering, wherein said covering comprises cellulosic wick material and said combustible material comprises a thermoplastic material.

5,066,312

FLEXIBLE ABRASIVES

Maher Ishak, Pte. Claire, and Alexander Schwartz, Westmount, both of Canada, assignors to Abrasive Technology N.A., Inc., Westerville, Ohio

Division of Ser. No. 161,940, Feb. 29, 1988, Pat. No. 4,874,478.
This application Aug. 25, 1989, Ser. No. 398,335
Claims priority, application Canada, Feb. 27, 1987, 530811; Mar. 13, 1987, 531996; Oct. 21, 1987, 549901; Nov. 20, 1987, 552387; Jan. 7, 1988, 556049
Int. Cl.[5] B24D 11/00
U.S. Cl. 51—295 17 Claims



1. An abrasive member comprising a flexible sheet having a plurality of discrete metal protuberances fixedly attached to one surface thereof, each of said protuberances comprising a lower thin layer of a first metal fixedly attached to said flexible sheet and an upper electrodeposited layer of a second metal different from said first metal and having abrasive material embedded therein.

5,066,313

WIRE ELECTRODE REPLACEMENT FOR ELECTROSTATIC PRECIPITATORS

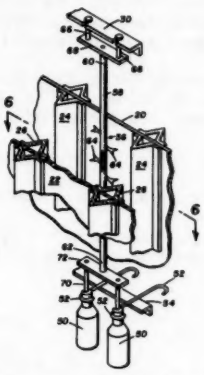
Timothy P. Mallory, Sr., Pace, Fla., assignor to Southern Environmental, Inc., Pensacola, Fla.

Filed Sep. 20, 1990, Ser. No. 585,190
Int. Cl.[5] B03C 3/00
U.S. Cl. 55—2 9 Claims

9. A method of replacing wire discharge electrodes in an electrostatic precipitator having first and second parallel vertical substantially planar grounded electrodes, each of said grounded electrodes having a plurality of vertical conductive stiffeners evenly spaced along the width thereof, corresponding stiffeners on said first and second grounded electrodes being opposed whereby an adjacent pair of stiffeners on said first grounded electrode together with a corresponding adjacent pair of stiffeners on said second grounded electrode define a discharge space partially separated from adjacent discharge spaces by said stiffeners, said precipitator further comprising a high voltage frame located above said plurality of discharge spaces and extending parallel to the planes of said grounded electrodes, said frame having a pair of spaced mounting means above each said discharge space for supporting a corresponding pair of wire discharge electrodes, a line connecting each said pair of mounting means being parallel to and equally spaced from the planes of said first and second grounded electrodes, said line having a given length, each said wire discharge electrode having shroud means on an upper end thereof mating with said corresponding mounting means and having a lower end, each said lower end of said wire discharge electrodes comprising suspending means suspending a weight individual to said wire discharge electrode in an original position, and means for restricting movement of said weights in the horizontal plane from said original positions, said method comprising:

(a) removing said pair of wire discharge electrodes;

(b) replacing said pair of wire discharge electrodes with a single rigid discharge electrode, said rigid discharge electrode comprising a rigid vertical support having a vertical



length between an upper end and a lower end thereof, and having a plurality of corona-generating members spaced along said vertical length, said corona-generating members extending laterally from and on opposite sides of said vertical support and generally parallel to the planes of said grounded electrodes to discharge regions spaced apart on opposite sides of said vertical support substantially the same distance as said given length;

(c) said rigid discharge electrode comprising a pair of shroud means on said upper end of said rigid discharge electrode, said pair of shroud means being spaced apart a distance equal to said given length and mating with said pair of mounting means; and

(d) said rigid discharge electrode comprising a pair of suspending means on said lower end of said rigid discharge electrode, said pair of suspending means being spaced apart a distance equal to said given length and suspending said weights in said original positions.

5,066,314

METHOD OF REMOVAL OF ACID COMPONENTS FROM A GAS

Iosif L. Leites; Yulya G. Karpova; Vladimir M. Berchenko, all of Moscow, U.S.S.R.; Takeshi Hihara, Zushi, Japan; Toshimitsu Shimizu, Yokohama, Japan; Norio Takahashi, and Isamu Ueno, both of Yokosuka, Japan, assignors to State Scientific-Research Designing Institute for Nitrogen Industry and for Products of Organic Synthesis, Moscow, U.S.S.R. and Toho Kagaku Kogyo Co., Ltd, Tokyo, Japan

Filed Jul. 9, 1990, Ser. No. 549,967
Claims priority, application Japan, May 14, 1990, 2-123754
Int. Cl.[5] B01D 47/06, 53/14
U.S. Cl. 55—44 4 Claims

1. A method of removal of acid components from a gas

mixture containing acid components using an organic absorbent based on ethers of polyglycols, comprising the sequential steps of:

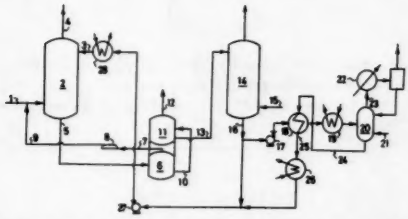
(a) absorbing acid components of the gas mixture in the absorbent by a countercurrent contact of the gas mixture and the absorbent under pressure in an absorber maintained at a temperature of less than 20° C.,

(b) discharging the resulting gas mixture from a top of the absorber,

(c) discharging the absorbent from a bottom of the absorber to an expander in which pressure is maintained lower than in the absorber, and discharging most of the acid components from the absorbent therein,

(d) discharging said absorbent from the expander to a top of a desorber where pressure is maintained lower than in the expander,

(e) discharging remaining acid components from the absorbent by a countercurrent of the absorbent and air or N_2 gas supplied at a bottom of the desorber to reduce an acid



component of the absorbent to not more than 0.5 Nm^2m^3, and extracting the absorbent from the bottom of the desorber,

(f) furnishing a major portion of said absorbent to a refrigerator, cooling the absorbent in said refrigerator to a temperature of less than 20° C., furnishing the absorbent from the refrigerator to the top of the absorber and contacting it with a new gas mixture containing acid components by a countercurrent,

(g) furnishing a remaining amount of absorbent extracted from the bottom of the desorber, after being heated at a heating device, to the top of a dehydration vessel which is maintained at a temperature of 80°–150° C. and under a pressure of 0.8–1.3 atm, where moisture contained in the absorbent is discharged by countercurrent contact with a stripping gas, and

(h) joining the resultant dehydrated absorbent with said major portion of the absorbent being furnished to the refrigerator.

5,066,315

METHOD OF CLEANING A CYCLONE SEPARATION AND CYCLONE SEPARATOR FOR PRACTICING THE METHOD

Johann Haberl, Skärholmen, and Gösta Lundqvist, Grödinge, both of Sweden, assignors to Dustcontrol International AB, Norsborg, Sweden

PCT No. PCT/SE88/00628, § 371 Date May 21, 1990, § 102(e) Date May 21, 1990, PCT Pub. No. WO89/04711, PCT Pub. Date Jun. 1, 1989

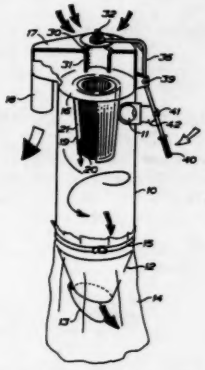
PCT Filed Nov. 18, 1988, Ser. No. 488,049

Claims priority, application Sweden, Nov. 20, 1987, 8704568

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—96 **9 Claims**

1. A method for cleaning a cyclone separator connected to a suction source and comprising an inlet chamber for gas mixed with dust, an outlet chamber for cleaned gas, said outlet chamber being connected to the suction source, a central outlet between said inlet chamber and said outlet chamber, and a filter unit disposed in said central outlet, said method comprising momentarily establishing a connection between the outlet chamber and the atmosphere to initiate a rapid pressure rise in the outlet chamber, said rapid pressure rise effecting a reversed gas flow through the filter unit in order to blow the filter unit, maintaining a communication between the outlet chamber and



the suction source during said rapid pressure rise, and closing an inlet to the inlet chamber concurrently with or immediately before establishing said connection.

5,066,316

EXHAUST GAS PURIFYING APPARATUS

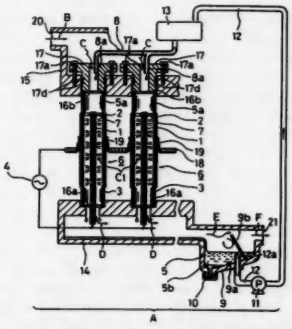
Yukio Ikeda, Ryugasaki, Japan, assignor to Niles Parts Co., Ltd., Tokyo, Japan

Filed Jul. 11, 1990, Ser. No. 551,242

Claims priority, application Japan, Oct. 6, 1989, 1-117596[U]; Oct. 6, 1989, 1-117597[U]; Oct. 6, 1989, 1-117598[U]

Int. Cl.[5] B03C *3/00*

U.S. Cl. 55—122 **16 Claims**



1. An exhaust gas purifying apparatus comprising:

an enclosure portion including an entrance for introducing exhaust gas into said enclosure portion and an exhaust opening for exiting purified exhaust gas from said enclosure portion;

at least one first electrode composed of an electric conductor having a surface defining a projecting formation;

at least one second electrode composed of an electric conductor having a surface lying opposite said first electrode;

an electric insulator attached to said surface of said second electrode, opposite to said first electrode;

a streamer corona generating portion composed of a high voltage electric power source connected to said first and second electrodes for generating bridged stream coronas stably within a space defined by said first electrode and said electric insulator over an extended period of time to

remove fine particles and harmful gases from said exhaust gas passing through said bridged stream coronas;

means for injecting an adhesive oil onto said surface of said electric insulator so that said adhesive oil is diffused and attracted to said surface to form a viscous oil film thereon; and

means for circulating said adhesive oil through said enclosure portion.

5,066,317

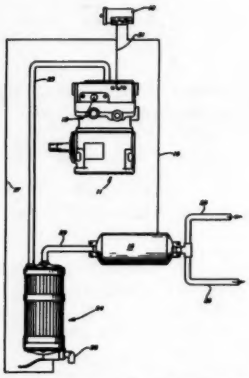
COMPRESSED GAS DRYER SYSTEM WITH PRESSURE RETENTION

Dario Gross, Corunna, and Roger L. Sweet, Fowlerville, both of Mich., assignors to Midland Brake, Inc., Kansas City, Mo.

Filed Dec. 15, 1989, Ser. No. 451,222

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—218 **4 Claims**



1. In a governor-controlled gas compressor system for maintaining gas pressure in a gas reservoir between a predetermined first pressure level at which said compressor commences to compress pressurizing intake gas from a supercharged source thereof and a predetermined higher second pressure level at which the compressor ceases to compress said gas, said system including a source of supercharged gas, a gas compressor, a governor and a gas dryer vessel intermediate said compressor and said reservoir to effect drying of the compressed gas, the said gas dryer vessel being provided with gas inlet means in communication with said compressor, and gas outlet means in communication with said reservoir, and a purge valve for exhausting purge gas therefrom, and having a drying chamber therein having a desiccant material disposed therein and a purge air chamber in communication with said drying chamber, the improvement which consists in pressure retention means within said purge valve to control exhausting purge gas therefrom only when the pressure of the purge gas in said pressure retention means exceeds the pressure of the pressurized intake gas from the supercharged source thereof.

5,066,318

FILTER ELEMENT GASKET

Charles M. McDonough, Stamford, Conn., assignor to PCF Group, Inc., Stamford, Conn.

Filed Apr. 13, 1990, Ser. No. 508,560

Int. Cl.[5] B01D *29/21*

U.S. Cl. 55—502 **10 Claims**

1. In combination, a filter element for a dust collector having a metal flange to be sealed against leakage and a resilient gasket for sealing said flange against a metal plate, said gasket comprising:

a top wall, having an inner surface adjoining said flange and formed from an electrically conductive resilient material to dissipate static charges from said filter element to a metal plate, said top wall having a broad outer surface opposite said inner surface for sealing against said metal plate;

a lip extending transversely from said top wall and defining a cavity containing said flange; and

an opening aligned with a corresponding opening in said flange.

5,066,319

FILTER CARTRIDGE

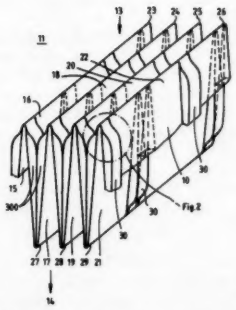
Hans-Joachim Lippold, Wredeweg 8, D-1000 Berlin 22, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 474,290

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1989, 3903698; May 19, 1989, 3916838

Int. Cl.[5] B01D *46/52*

U.S. Cl. 55—521 **25 Claims**



1. Filter cartridge having a block construction, comprising a plurality of zig-zag fold walls having fold edges between adjacent ones of said plurality of fold walls, said fold walls including a material folded in a zig-zag fashion for a medium to be filtered to pass through from one edge area of the plurality of zig-zag fold walls in the direction of the edge area of the opposite side of the fold walls, said filter material being made of a material which can be permeated by the medium to be filtered, said fold walls being provided with offsets which extend out on both sides of each fold wall in the direction of flow of the medium, and said offsets having side faces and a length which is greater than their width, wherein:

the offsets of adjacent fold walls lie in contact with one another to serve as spacers and stiffeners, and that the height of the offsets lying in contact with one another of two fold walls connected together by a said fold edge increases in the direction of the opposite fold edge and therefore the spacing between two adjacent fold walls

decreases uniformly in the direction of flow of the medium until a point at which the medium to be filtered passes through the fold wall from which point on the spacing increases;

said offsets are of a constant width perpendicular to the direction of flow; and

the side faces of said offsets extend perpendicularly to said fold edges which connect together said plurality of fold walls.

5,066,320

METHOD FOR BENDING COMPLEX SHAPES ON A GLASS SHEET

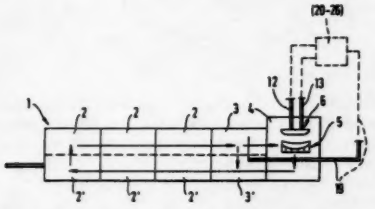
Esko O. Lehto, Kangasala, and Jukka H. Vehmas, Tampere, both of Finland, assignors to Tamglass Oy, Tampere, Finland

Filed Jun. 27, 1990, Ser. No. 544,519

Claims priority, application Finland, Mar. 30, 1990, 901601

Int. Cl.[5] C03B *23/35*

U.S. Cl. 65—106 **14 Claims**



10. A method as set forth in claim **2**, wherein a hot gas blown during the bending of a glass sheet through blasting orifices of the shaping surface of press bending mould is used to maintain a top surface of glass sheet at least locally hotter than a bottom surface.

5,066,321

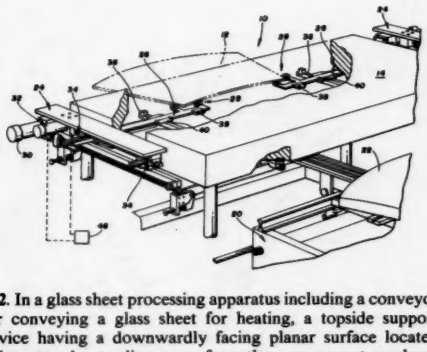
DEVICE FOR POSITIONING HOT GLASS SHEETS

Joseph O. Kramer, Toledo; Dexter H. McMaster, Perrysburg, both of Ohio, and Eustace H. Mumford, Ottawa Lake, Mich., assignors to Glasstech, Inc., Perrysburg, Ohio

Filed Jul. 19, 1990, Ser. No. 554,373

Int. Cl.[5] C03B *35/24*

U.S. Cl. 65—182.2 **13 Claims**



2. In a glass sheet processing apparatus including a conveyor for conveying a glass sheet for heating, a topside support device having a downwardly facing planar surface located adjacent and extending away from the conveyor at an elevation just slightly above a plane of conveyance of the glass sheet during heating for receiving the heated glass sheet from the conveyor and supporting the glass sheet by vacuum and pressure without engagement on the topside support device, a device for positioning the hot glass sheet on the topside support device, the device comprising: a pair of laterally spaced glass sheet locators fixedly mounted relative to the topside support device; each glass sheet locator including mechanical linkage having a glass sheet catcher movably mounted below the topside support device in the plane of conveyance for engaging the heated glass sheet without relative motion between said catcher and glass sheet as it arrives at the topside support device; and each locator including a first actuator for actuating longitudinal movement and a second actuator for actuating transverse movement of said glass sheet catcher via said linkage for decelerating and positioning the glass sheet at an accurate stationary position relative to the topside support device.

5,066,322

METALLIC COOLANT FOR A METALLURGICAL BATH

Jan A. Groothoff, Aerdenhout, Netherlands, assignor to Heckett Holland B.V., Ijmuiden, Netherlands

Continuation of Ser. No. 289,020, Dec. 23, 1988, abandoned. This application Jun. 7, 1990, Ser. No. 534,304

Claims priority, application Netherlands, Jan. 18, 1988, 8800095

Int. Cl.[5] B22F *1/00*

U.S. Cl. 75—255 **5 Claims**

1. Metallic coolant for use with a metallurgical bath in which the chemical composition of the metallurgical bath substantially corresponds to the chemical composition of the coolant, said coolant being selected from the group consisting of metallic steel and aluminum ball-shaped metallic bodies of sizes not less than 5 mm and not more than 60 mm, the ball-shape factor B of the coolant having a value of at least 0.57.

5,066,323

COMPOSITIONS COMPRISING HEXAFLUOROPHOSPHATES AND METALS AS STRUCTURE REFINER FOR ALUMINIUM-SILICON ALLOYS

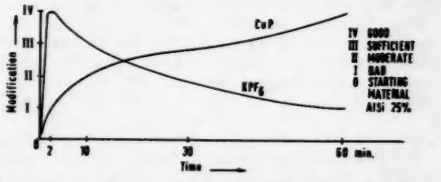
Jan P. Mulder, Delfzijl, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Jun. 12, 1989, Ser. No. 363,848

Claims priority, application United Kingdom, Jun. 13, 1988, 8813939

Int. Cl.[5] C22C *1/06*

U.S. Cl. 75—305 **7 Claims**



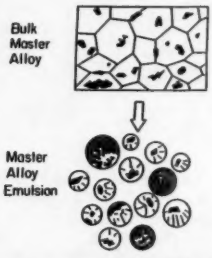
1. Master composition suitable for addition to molten aluminum-silicon casting alloys to promote the formation of a refined grain structure during the solidification of the alloys, said composition comprising a hexafluorophosphate in an amount ranging from 20 to 80% (w/w) and one or more metals selected from the group consisting of iron, copper, manganese and zinc.

5,066,324

METHOD OF EVALUATION AND IDENTIFICATION FOR THE DESIGN OF EFFECTIVE INOCULATION AGENTS

John H. Perepezko, and Mark K. Hoffmeyer, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Feb. 26, 1991, Ser. No. 485,931
Int. Cl.[5] B22D *23/08*
U.S. Cl. 75—335 20 Claims



1. A method of evaluating or identifying effective and ineffective inoculation agents in a bulk metal or metal alloy, the method comprising the steps of:

(a) heating the bulk metal or metal alloy to a molten state;

(b) emulsifying the bulk metal or metal alloy containing the inoculation agents in a molten state in a carrier fluid to produce micron-sized droplets;

(c) cooling the metal and the carrier fluid to cause solidification of the bulk metal or metal alloy, and simultaneously recording the thermal signals produced by the metal droplets;

(d) re-heating the bulk metal or metal alloy to a molten state;

(e) emulsifying the bulk metal or metal alloy containing the inoculation agents a second time in a molten state in the carrier fluid to produce micron-sized droplets;

(f) quenching the metal droplets just below the initial nucleation onset temperature that is derived from the recordation of the thermal signals in step (c) to preserve the microstructure at the onset of the highest nucleation reaction temperature;

(g) examining the microstructures of the droplets and segregating the effective and ineffective inoculant particle based upon the microstructures associated with effective nucleation; and

(h) identifying specific active and inactive inoculant agents in the droplets.

5,066,325

COGENERATION PROCESS FOR PRODUCTION OF ENERGY AND IRON MATERIALS, INCLUDING STEEL

John M. Lehto, Cokato, Minn., assignor to Northern States Power Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 234,914, Aug. 22, 1988, which is a continuation-in-part of Ser. No. 153,242, Feb. 8, 1988, which is a continuation-in-part of Ser. No. 91,427, Aug. 31, 1987, abandoned. This application Feb. 24, 1989, Ser. No. 314,988
Int. Cl.[5] C21B *11/02*
U.S. Cl. 75—499 20 Claims

1. A process for the production of electricity with relatively efficient use of fuel material; said process including the steps of:

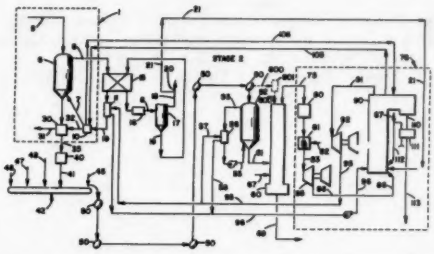
(a) providing a low grade coal fuel;

(b) performing a liquefaction procedure on said coal fuel to remove oil and volatiles therefrom, and to generate a resultant coal char product;

(c) pelletizing the coal char product to form coal char product pellets, said step of pelletizing comprising pelletizing at least a portion of the coal char product in combination with reducible solid iron material to form coal char product pellets containing reducible solid iron material;

(d) charging a cupola with the coal char product and the reducible iron material, said step of charging a cupola being characterized by charging substantially all the coal char product in the form of the coal char product pellets and substantially all the reducible solid iron material in the form of pellets containing the coal char product in combination with the reducible solid iron material;

(e) reducing and melting substantially all the reducible solid iron material in the coal char product pellets by heating



the pellets in the cupola at a suitable temperature in the presence of a sufficient upward flow of process gases, with the resultant formation of reduced molten iron material, hot slag material, and hot product gases;

(f) forming a mineral wool fiber material from the hot slag material;

(g) tapping the hot product gases from an upper portion of the cupola;

(h) directing the hot product gases downstream to electrical production equipment; and,

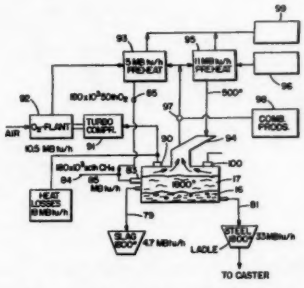
(i) producing electricity from the hot product gases.

5,066,326

GAS-FIRED STEELMELTING PROCESS

Jagdish A. Agarwal, Sudbury; Richard Gannon, Andover; Victor Goldfarb, Swampscott; David Stickler, Carlisle, and Jaime Woodroffe, Andover, all of Mass., assignors to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 416,925, Oct. 4, 1989, Pat. No. 4,981,285. This application May 7, 1990, Ser. No. 519,509
Int. Cl.[5] C21B *13/10*
U.S. Cl. 75—581 9 Claims



1. A slagmelt process for melting solid ferrous metal scrap in a slagmelt furnace to produce low carbon-content steel and for insulating said scrap against contact with oxidizing gases during the melting thereof, comprising the steps of:

(a) providing a continuous layer consisting essentially of a chemically-controlled slag composition in a slagmelt furnace;

(b) superheating said layer of slag composition to molten

condition by introducing against and/or beneath the surface thereof one or more jets consisting essentially of an ignited mixture of a fuel gas and an oxidizer gas, the temperature, direction and velocity of said jets heating and circulating said slag layer to a substantially uniform temperature above the melting temperature of said ferrous metal scrap; and

(c) immersing a supply of pieces of said solid ferrous metal scrap beneath the surface of said layer of molten slag composition to melt said scrap pieces by heat conducted and convected from said layer of molten slag composition while the scrap pieces are insulated by the layer of slag composition against oxidation and other undesirable reactions, and against exposure to carbon dioxide, water vapor, oxygen, air or other gases present in the atmosphere above said slag layer during the melting of said solid ferrous metal scrap pieces, to form a molten layer of low carbon-content ferrous metal beneath said superheated layer of slag composition.

5,066,327

METHOD FOR MANUFACTURING COLD BONDED PELLETS

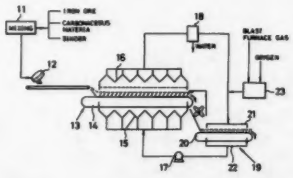
Hideomi Yanaka, and Yotaro Ohno, both of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,496

Claims priority, application Japan, Jun. 20, 1989, 1-155687

Int. Cl.[5] C22B *1/243*

U.S. Cl. 75—770 **8 Claims**



1. A method for manufacturing cold bonded pellets comprising the steps of:

mixing fine iron ore with binder and pelletizing the mixture of the fine iron ore and the binder to form green pellets;

charging said green pellets into a travelling grate to form a layer of the green pellets on the travelling grate;

blowing a curing gas containing carbon dioxide through the layer of the green pellets on the travelling grate, the green pellets thereby being cured by the curing gas, and the gas having passed through the layer of the green pellets being discharged;

passing the gas having passed through the layer of the green pellets and having been discharged through a dehydrator;

mixing the gas which has passed through the dehydrator with combustion gas to form a gas mixture, the combustion gas being obtained by combusting with oxygen a blast furnace gas, which is generated in a blast furnace process wherein iron ore and coke are charged from the top of a blast furnace into the blast furnace and pure oxygen is blown from tuyeres into the blast furnace, to manufacture pig iron,

passing the pellets which have been cured through a drier, blowing said gas mixture through the pellets in the drier, and using the gas mixture passed through the drier as the curing gas.

5,066,328

ANTIMICROBIAL COATING

Clifford Zlotnik, West Mifflin, Pa., assignor to Unsmoke Systems, Inc., Braddock, Pa.

Filed Mar. 9, 1990, Ser. No. 491,260

Int. Cl.[5] A01N *33/00, 59/20*

U.S. Cl. 106—18.32 **4 Claims**

1. An amtimicrobial mixture comprising;

(a) copper-8-quinolinolate present in from about 0.25 to 10% by weight, mixed with

(b) a binder composition comprising about 50 to 60 wt.% dioctyl sulfosuccinate sodium salt, about 15 to 40 wt.% water, about 4 to 15 wt.% ethanol, and about 5 to 20 wt.% substituted hydantoin, said binder composition imparting sufficient fluidity to the copper-8-quinolinolate to permit the mixture to be applied as a liquid and to adhere to metal, fiberglass or plastic media.

5,066,329

WRITING FLUID

Werner Schmickl, Neumarkt, and Roland Meichsner, Buttenheim, both of Fed. Rep. of Germany, assignors to J. S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Oct. 1, 1990, Ser. No. 590,920

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1989, 3941662

Int. Cl.[5] C09D *11/00, 11/16*

U.S. Cl. 106—20 **11 Claims**

1. A water-based writing fluid having at least one additive which reduces drying of the writing fluid at the point of a writing utensil, the additive comprising an ether having a polyglycol radical and a single alcohol of the formula $C_xH_{2x+1}—O—(CH_2—CH_2—O)_nH$, whose gel point is greater than 30° Celsius, which is dispersed in the aqueous writing fluid, the value of x being greater than or equal to 16 and less than or equal to 18 and the value of n being not greater than 8.

5,066,330

PAINTABLE COMPOSITIONS FOR PROTECTING METAL AND CERAMIC SUBSTRATES

Cressie E. Holcombe, Jr., Farragut, and Lloyd R. Chapman, Knoxville, both of Tenn., assignors to ZYP Coatings, Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 205,090, Jun. 10, 1988, Pat. No. 4,898,618. This application Dec. 20, 1989, Ser. No. 453,866

The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.

Int. Cl.[5] C09K *15/02*

U.S. Cl. 106—287.34 **19 Claims**

1. A paintable composition for producing, when dry, a coating for metal and ceramic substrates to inhibit deleterious reactions and emissions during elevated temperature operation and thermal cycling, said composition consisting essentially of:

about 6 to about 38 wt % aqueous silica-containing liquid having about 27±9 wt % silicon dioxide;

about 4.5 to about 10 wt % of at least one transition metal component selected from oxides and precursors of oxides of cobalt, chromium, iron, manganese, nickel, titanium, zinc and zirconium;

about 45 to about 65 wt % of a refractory filler material; and

up to about 33 wt % aqueous diluent.

5,066,331

WATER-SOLUBLE ROSIN POLYAMIDE RESINS

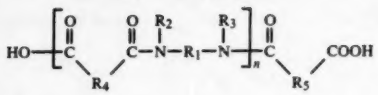
G. Frederick Hutter, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 21, 1989, Ser. No. 454,416

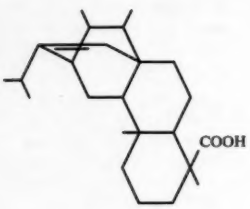
Int. Cl.[5] C09D *11/08*

U.S. Cl. 106—30 **29 Claims**

15. A water soluble resin comprising at least one compound of the general form:



wherein R_1=alkylene and R_2 and R_3 are alkyl; or wherein R_1=alkylene, R_2+R_3=alkylene and R_1, R_2, and R_3, together with the two nitrogens to which they are bonded, form a nitrogen-containing heterocyclic ring system, where at least one R_4 or R_5 is of the general form:



and any remaining R_4 or R_5 are independently alkylene, cycloalkylene or phenylene and wherein n=a positive integer.

5,066,332

LOW CORROSION HOT MELT INK

Edward A. Brown, Kent; John P. N. Haxell, Bath, and Derek E. Wilson, Somerset, all of Great Britain, assignors to Coates Electrographics Limited, Bath, England

Filed May 23, 1990, Ser. No. 528,103
Int. Cl.[5] C09D *11/12*
U.S. Cl. 106—31 10 Claims

1. A hot melt ink comprising a coloring agent, a thermoplastic vehicle containing the coloring agent, and 0.5 to 10 weight percent of a corrosion inhibitor selected from the group consisting of a basic heat stable metallo-organic sulphonate and overbased sulphurized metallo-phenate.

5,066,333

FILLER FOR PATTERNING OF CERAMICS PRODUCT AND PROCESS FOR PRODUCING THE SAME

Yutaka Tomioka; Satoru Nakanishi; Seizi Shintake, and Hideki Yoneda, all of Kitakyushu, Japan, assignors to Toto Ltd., Fukuoka, Japan

Filed Nov. 13, 1989, Ser. No. 436,302
Claims priority, application Japan, Nov. 16, 1988, 63-290775
Int. Cl.[5] C04B *14/00*
U.S. Cl. 106—400 15 Claims

1. A filler for patterning a ceramics product, wherein said ceramics product exhibits, upon firing, specific shrinkage and water absorption properties, and wherein the filler is dispersed into the ceramics product to impart a natural stone grain pattern to the ceramics product, the filler comprising

(a) a ceramics base material, said ceramics base material being present in the filler in an amount such that, and having a composition sufficiently similar to the composition of the ceramics product such that, upon firing, the filler exhibits substantially the same shrinkage and water absorption properties as the ceramics product;

b) a pigment; and

c) a binder effective substantially to prevent swelling or dissolution of the filler during mixing with a slip for the ceramics product.

5,066,334

FUNGICIDAL AND CORROSION INHIBITING PAINT PIGMENTS

John D. Pera, Cordova; Loel L. Hickman, Memphis, both of Tenn., and Lawrence S. Conoway, Dundee, Miss., assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Dec. 19, 1989, Ser. No. 451,604
Int. Cl.[5] C09C *1/02*
U.S. Cl. 106—462 16 Claims

1. A silica-coated calcium pyroborate pigment in particulate form having an effective diameter of less than 40 microns, comprising hydrated calcium pyroborate hydrogen bonded to a polymerized amorphous hydrated silica containing both Si—O—Si and Si—OH bonds.

5,066,335

GLASS-LIKE POLYSACCHARIDE ABRASIVE GRIT

Christopher C. Lane, Laprairie; Ruben P. Lenz, Laval-sur-le-Lac, and Costa Athanassoulias, Montreal, all of Canada, assignors to Ogilvie Mills Ltd., Montreal, Canada

Filed May 2, 1989, Ser. No. 346,504
Int. Cl.[5] B08B *7/00*
U.S. Cl. 134—7 47 Claims

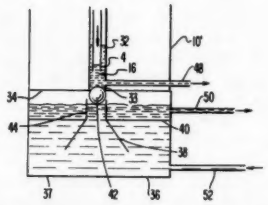
1. A method comprising the step of treating a surface with particulate, wherein the particulates are glass-like polysaccharide particles which are projected against the surface to be treated.

5,066,336

METHOD FOR CLEANING REAGENT DELIVERY PROBES

Julie F. Hoffman, Durham, N.C., and Lionel D. Jones, II, Ventura, Calif., assignors to Akzo N.V., Arnhem, Netherlands

Division of Ser. No. 443,954, Dec. 1, 1989, Pat. No. 4,989,623.
This application Sep. 29, 1990, Ser. No. 588,168
Int. Cl.[5] B08B *9/00, 9/02, 9/06*
U.S. Cl. 134—22.12 11 Claims



1. A process for cleaning a hollow delivery probe, used in a sample handling system, said probe having a free end, said process comprising:

forcing a cleaning solution through at least a portion of the probe to expel the cleaning solution from the free open end of the probe; and

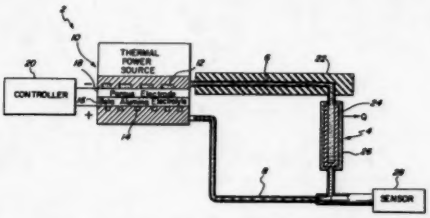
deflecting the expelled cleaning solution onto the outside of the probe by directing the expelled cleaning solution into a recess having a closed bottom and which is shaped for creating a fountain of the expelled cleaning solution wherein the deflected amount is sufficient to clean the outside of the probe.

5,066,337

THERMAL POWER TRANSFER SYSTEM USING APPLIED POTENTIAL DIFFERENCE TO SUSTAIN OPERATING PRESSURE DIFFERENCE

Pradeep Bhandari, Glendora, and Toshio Fujita, Arcadia, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 16, 1990, Ser. No. 568,130
Int. Cl.[5] H01L *37/00*
U.S. Cl. 136—202 **6 Claims**



1. A thermal power transfer system using a phase change liquid-gas fluid in a closed loop configuration, comprising:

a gas conduit;

a liquid conduit;

a heat exchange member for inputting thermal energy into the fluid so that the pressure of the gas conduit is higher than the liquid conduit;

barrier means between the gas conduit and the liquid conduit to maintain a pressure differential while permitting transmission of the fluid through the barrier means, including a solid electrolyte member having the capability of transmitting ions of the fluid through the electrolyte member and a porous electrode operatively positioned relative to the electrolyte member for creating an electrical field across the electrolyte member to drive the ions of the fluid through the solid electrolyte member;

means, attached to the electrode member, for applying an electrical field to force the ions of the fluid from the lower pressure liquid conduit to the higher pressure gas conduit, and

means, connected to the gas conduit and liquid conduit for outputting thermal energy.

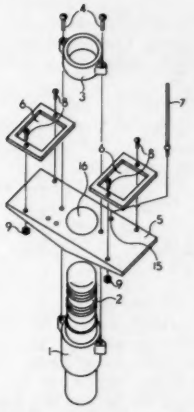
5,066,338

SOLAR POWERED NAVIGATION BUOY GENERATOR

Roy D. Meyers, 15 Cooper St., Lake George, N.Y. 12845

Filed Apr. 13, 1990, Ser. No. 512,130
Int. Cl.[5] H01L *31/042*; B63B *22/00*
U.S. Cl. 136—244 **1 Claim**

1. A solar generating system designed to convert existing navigation buoys using conventional throw-away batteries to more economical rechargeable batteries lasting several years, said invention comprising a flat rectangular stainless steel mounting platform with two solar panels and two flexible antennas mounted on said platform and a hole punched in the center of said platform in the space between said two solar panels and sized to fit over the existing caisson of said buoy and adapted to be secured in place on said existing buoy caisson by means of the existing lens locking nut and security bolt of said caisson, a wiring harness connected to said solar panels mounted on said flat rectangular stainless steel platform adapted to extend through the wall of said buoy caisson and to connect with said rechargeable battery, further including a



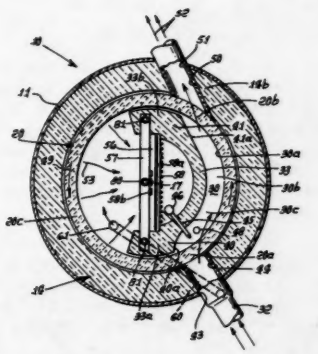
series connected blocking diode to prevent the battery from discharging during dark periods.

5,066,339

ROTARY RADIATING BED THERMOPHOTOVOLTAIC PROCESS AND APPARATUS

James G. P. Dehlsen, 21221 Carriage Dr., Tehachapi, Calif. 93561

Filed Apr. 26, 1990, Ser. No. 514,921
Int. Cl.[5] H01L *31/058*
U.S. Cl. 136—253 **25 Claims**



1. A combustion/emitter/regeneration process capable of operating at high temperature for sustained periods of time, that includes

a) flowing reactants including fuel and air to a combustion zone,

b) adding recuperated heat to at least two of the reactants flowing to said zone,

c) combusting the reactants at said zone to produce combustion products at high temperature,

d) extracting heat from said combustion products for return to said at least one of the reactants as said recuperated heat,

e) removing the products of combustion at reduced temperature, and

f) providing a porous bed at and to which said extracted heat is transferred,

g) rotating said bed about a rotation axis,

h) and radiating light from said hot rotary bed and converting said radiated light into photovoltaic produced electricity,

i) said bed having a cylindrical wall, and said step a) including flowing relatively cooler air through heated extents of said rotating bed wall into said combustion zone,

j) said step d) including flowing said high temperature combustion products through said rotating bed wall to transfer heat thereto,

k) causing said cooler air to flow through the bed at a first location, and causing said combustion products to flow through the bed at a second location spaced about said axis from said first location,

l) and providing and locating a photovoltaic cell within a hollow interior defined by the bed, to receive incident light radiating inwardly from said bed spaced from said second location and said first location.

5,066,340

PHOTOVOLTAIC DEVICE

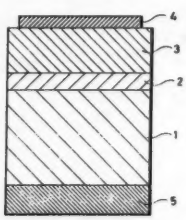
Masayuki Iwamoto, Hyogo; Kouji Minami, and Toshihiko Yamaoki, both of Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 6, 1990, Ser. No. 563,567

Claims priority, application Japan, Aug. 9, 1989, 1-206143

Int. Cl.[5] H01L *31/075, 31/0368, 31/0376*

U.S. Cl. 136—258 **5 Claims**



1. A photovoltaic device comprising a crystalline layer of a first conductivity type formed of crystalline silicon semiconductor material; an amorphous layer of the opposite conductivity type formed of amorphous silicon semiconductor material, and a microcrystalline layer composed of substantially intrinsic microcrystalline silicon semiconductor material, provided between said crystalline layer and said amorphous layer.

5,066,341

METHOD OF CONDITIONING AN ARTICLE OF SHAPE MEMORY METALLIC ALLOY HAVING TWO REVERSIBLE SHAPE MEMORY STATES

Guy Grenouillet, Villers-le-Lac, France, assignor to Nivarox-FAR S. A., Switzerland

Filed Jan. 26, 1990, Ser. No. 471,140

Claims priority, application Switzerland, Feb. 8, 1989, 00428/89

Int. Cl.[5] C21D *8/00*

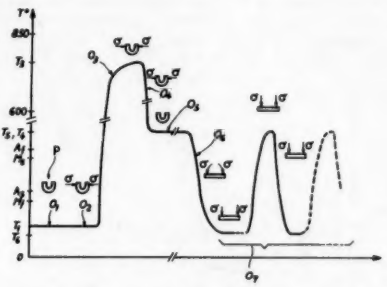
U.S. Cl. 148—11.5 C **8 Claims**

1. A method of conditioning an article made from metallic alloy capable of undergoing reversible transformation from the crystallographic phase state of the austenitic type to the crystallographic phase state of the martensitic type for causing the article to have a reversible memory of two shape memory states, which comprises:

holding the article under a mechanical stress at ambient temperature in the form constituting the first shape memory state,

maintaining the article under a mechanical stress in its first shape memory state while heating the mechanically held article to transform it into a state of the austenitic crystallographic phase while the article remains in its first shape memory state,

subjecting the article held under such mechanically stress in its first shape memory state to a sudden lowering of temperature and to thermal stabilization treatment, while preserving its austenitic state, and



subjecting the article to an education process in order to shape it into the second shape memory state.

5,066,342

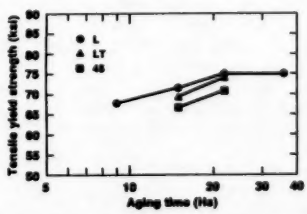
ALUMINUM-LITHIUM ALLOYS AND METHOD OF MAKING THE SAME

Roberto J. Rioja, Lower Burrell, Pa.; Joel A. Bowers, Bettendorf, Iowa, and R. Steve James, Gibsonia, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 149,802, Jan. 28, 1988. This application Jun. 19, 1989, Ser. No. 367,791

Int. Cl.[5] C22F *1/04*

U.S. Cl. 148—12.7 A **46 Claims**



1. A method of making lithium containing aluminum base flat rolled products having improved corrosion resistance and having improved toughness properties for plate and improved anisotropy for sheet, the method comprising the steps of:

(a) providing a body of aluminum base alloy consisting essentially of 0.2 to 5.0 wt. % Li, 0.05 to 6.0 wt. % Mg, at least 2.45 wt. % Cu, 0.1 to 1.0 wt. % Mn, 0.05 to 6.0 wt. % Zn, 0.5 wt. % max. Fe, 0.5 wt. % max. Si, at least one of the elements selected from the group Cr, V, Hf, Zr, Ti, Sc and Ce with Cr, V, Zr, Ti and Sc in the range of 0.01 to 0.2 wt. %, Hf up to 0.6 wt. % and Ce in the range of 0.01 to 0.5 wt. %, Mg and Zn maintained in a ratio in the range of 0.1 to less than 1, the balance aluminum and incidental impurities;

(b) bringing the body to a temperature for at least one low temperature hot working operation to put said body in a condition for recrystallization;

(c) subjecting said body to at least one controlled low temperature hot working operation to provide an intermediate product;

(d) recrystallizing said intermediate product;

(e) hot working the recrystallized product; and

(f) solution heat treating, quenching and aging said recrystallized and hot worked product to provide a product having a metallurgical structure generally lacking intense work

texture characteristics, the product having said improved level of properties.

5,066,343

PROCESS FOR PREPARATION OF THIN GRAIN ORIENTED ELECTRICAL STEEL SHEET HAVING SUPERIOR IRON LOSS AND HIGH FLUX DENSITY

Shozaburo Nakashima; Kenzo Iwayama, and Isao Iwanaga, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

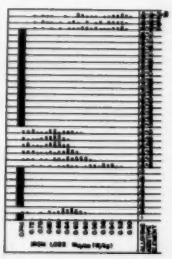
Filed May 7, 1990, Ser. No. 520,109

Claims priority, application Japan, May 13, 1989, 1-119145

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **2 Claims**



1. A process for the preparation of a thin grain oriented electrical steel sheet or strip having a reduced iron loss and a high flux density, which comprises casting a molten silicon steel to form a silicon steel strip having a thickness of 0.2 to 5 mm, by a synchronous continuous casting machine in which the relative movement speed of the cast strip to the inner wall surface of a casting mold is the same, which molten steel comprises 0.050 to 0.120% by weight of C, 2.8 to 4.0% by weight of Si and 0.05 to 2.25% by weight of Sn, annealing the cast steel strip at a temperature of at least 920° C. for at least 30 seconds, rolling the annealed strip at a reduction ratio of 81 to 95% at final cold rolling to obtain a final thickness of 0.05 to 0.25 mm, subjecting the resulting cold rolled steel strip to decarburization annealing, coating the decarburized steel with an anneal separator and subjecting the steel strip to finish annealing, wherein the starting cast strip further comprises up to 0.035% by weight of S and 0.005 to 0.035% by weight of Se, with the proviso that the total amount of S and Se is in the range of 0.015 to 0.060% by weight, 0.050 to 0.090% by weight of Mn, with the proviso that the Mn content is in the range of {1.5×[content (% by weight) of S+content (% by weight) of Se[} to {4.5×[content (% by weight) of S+content (% by weight) of Se]} % by weight, 0.0050 to 0.0100% by weight of N, and {[27/14]×content (% by weight) of N+0.0030} to {[27/14]×content (% by weight) of N+0.0150} % by weight of acid-soluble Al, with the balance comprising Fe and unavoidable impurities.

5,066,344

PROCESS FOR PRODUCING AN ENDLESS BELT

Junichi Inami, Nara; Koozi Kikuta, Osaka; Satoshi Nakane, Nara; Kazumi Fujito, Osaka, and Hitoshi Hirosawa, Kyoto, all of Japan, assignors to Nitta Industries Corporation, Osaka, Japan

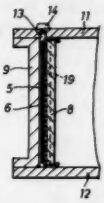
Continuation of Ser. No. 159,742, Feb. 24, 1988, abandoned. This application Feb. 13, 1990, Ser. No. 479,191

Claims priority, application Japan, Feb. 27, 1987, 62-45750; Feb. 27, 1987, 62-45751; Feb. 27, 1987, 62-45752

Int. Cl.[5] F16G *1/28*

U.S. Cl. 156—138 **15 Claims**

1. A process for producing an endless belt including a belt main body prepared from a liquid castable elastomeric material and a reinforcing fabric provided on a surface of the main body, wherein the process comprises: forming a liquid impermeable shock absorbing layer made of an elastomeric material on an inner surface of the reinforcing fabric; fitting the reinforcing fabric in a first mold die with the impermeable shock absorbing layer being exposed to another mating mold die;



forming an interspace between the fitted reinforcing fabric and the mating mold die; injecting the liquid castable elastomeric material at a pressure of up to 2 kg f/cm^2; and after filling of said interspace, applying a pressure to the injected material of from 10 to 30 kg f/cm^2 to firmly press the reinforcing fabric onto the first mold die without the cast elastomeric material permeating the reinforcing fabric.

5,066,345

APPARATUS AND METHOD FOR SPLICING WEBS OF INDETERMINATE LENGTH

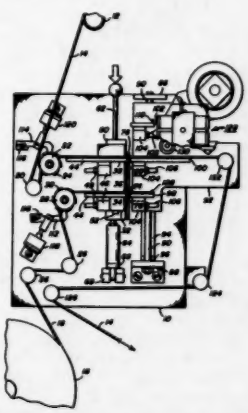
Michael Long; Lyndon R. Huttemann, both of Rochester; Robert W. Sanford, Wyoming, all of N.Y., and Robert D. Longboat, Ohsweken, Canada, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1990, Ser. No. 471,159

The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] B31F *5/00*; B65H *21/00*

U.S. Cl. 156—157 **14 Claims**



1. Apparatus for trimming the tail end of a first length of web and the lead end of a second length of web and for splicing such trimmed tail and lead ends together, comprising:

a first source of web of indeterminate length;

a second source of web of indeterminate length;

a first input platen for supporting web from said first source, said first platen having a first trailing edge;

a second input platen for supporting web from said second source, said second platen having a second trailing edge parallel to said first trailing edge;

means for selectively stopping movement of web from said

first and second sources across said first and second platens;

a process platen positioned opposite said trailing edges;

means for relatively moving said platens between a first position in which said process platen receives web from said first platen and a second position in which said process platen receives web from said second platen:

means operable in each of said first and second positions for cutting at said trailing edges web extending from both said first and said second sources, respectively, past said first and second trailing edges;

whereby a trimmed lead end of web on one of said first and second platens alternately may be abutted with and spliced to a trimmed tail end of web on said process platen as said means for moving shifts said platens between said first and second positions after actuation of said means for cutting; and

means for applying a strip of tape across such abutted tail and lead ends to splice them together.

5,066,346

APPARATUS AND METHOD FOR SPLICING WEBS OF INDETERMINATE LENGTH

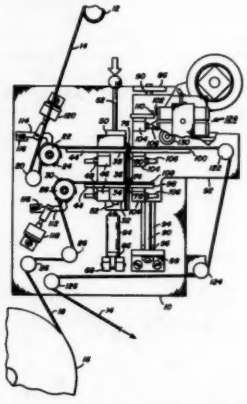
Michael Long; Lyndon R. Huttemann, both of Rochester, and Robert W. Sanford, Wyoming, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1990, Ser. No. 471,176

The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] B31F *5/00*; B65H *21/00*

U.S. Cl. 156—157 **13 Claims**



1. Apparatus for trimming the tail end of a first length of web and the lead end of a second length of web and for placing such trimmed tail and lead ends in abutment, comprising:

a first source of web of indeterminate length;

a second source of web of indeterminate length;

a first input platen for supporting web from said first source, said first platen having a first trailing edge;

a second input platen for supporting web from said second source, said second platen having a second trailing edge parallel to said first trailing edge;

means for selectively stopping movement of web from said first and second sources across said first and second platens;

a process platen positioned opposite said trailing edges;

means for relatively moving said platens between a first position in which said process platen receives web from said first platen and a second position in which said process platen receives web from said second platen; and

means operable in each of said first and second positions for cutting at said trailing edges web extending from both said first and said second sources, respectively, past said first and second trailing edges;

whereby a trimmed lead end of web on one of said first and second platens alternately may be abutted with a trimmed tail end of web on said process platen as said means for moving shifts said platens between said first and second positions after actuation of said means for cutting.

5,066,347

TAPE TRANSPORT APPARATUS AND METHOD OF INTRODUCING TAPE THERETO

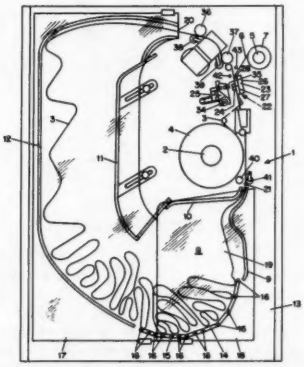
Hirokazu Yoshida, Tokyo, Japan, assignor to Otari Electric Co. Ltd., Japan

Filed Jul. 11, 1988, Ser. No. 217,568

Claims priority, application Japan, Jul. 11, 1987, 62-173399

Int. Cl.[5] B31F *5/06*; B65H *69/06*

U.S. Cl. 156—159 **7 Claims**



1. In a tape transport apparatus for manipulating leader tape and magnetic tape and for bidirectionally utilizing an endless-loop magnetic tape, wherein said tape transport apparatus comprises:

a loop-housing means for housing a variable length of tape and having first and second openings whereby tape may enter and exit said loop-housing means, the region between said two openings defining a tape handling path, said loop-housing means and said tape handling path defining a loop path for an endless-loop magnetic tape;

first guide means, splicing means, and second guide means disposed along the tape handling path between the said two openings, said first and second guide means disposed respectively toward said first and second openings;

tape transport means disposed along the tape handling path for running tape at one of said two openings in a first direction and in the opposite direction, and for running tape at the other of said two openings in a first direction and in the opposite direction;

said first guide means having a first position and a second position, said positions respectively guiding to the splicing means either tape from a reel means or tape from said first opening, said reel means capable of controllably supplying additional magnetic tape to said loop path and of controllably withdrawing magnetic tape from said loop path;

said second guide means having a first position and a second position, said positions respectively guiding to the splicing means either tape from said second opening or tape from a leader-tape housing means, said leader-tape housing means capable of controllably supplying leader tape to said loop path and of controllably withdrawing leader tape from said loop path;

said splicing means embracing the tape handling path between said first and second guide means, for cutting the

tape guided to it by the said first and second guide means, and for splicing the tape guided to it by the said first and second guide means;

and wherein leader tape from the leader-tape housing means has initially been directed from the leader-tape housing means, through the second guide means, through the splicing means, through the first guide means, through the first opening of the loop-housing means, through the loop-housing means, through the second opening of the loop-housing means, and through the second guide means, and wherein magnetic tape from the reel means has initially been directed to the first guide means, said first and second guide means being in said first and first positions respectively, whereby an end of the magnetic tape from the reel means and an end of the leader tape are juxtaposed;

the method for establishing an endless loop of magnetic tape comprising the steps of:

actuating the splicing means so as to cut and splice the juxtaposed ends;

actuating the leader-tape housing means, the reel means, and the tape transport means to withdraw the leader tape from the first opening of the loop-housing means and to introduce a selected length of magnetic tape into the second opening of the loop-housing means;

actuating the splicing means so as to cut the magnetic tape between the reel means and the second opening of the loop-housing means and the magnetic tape between the first opening of the loop-housing means and the leader-tape housing means;

placing the first guide means in said second position, whereby ends of the magnetic tape from the loop-holding means are juxtaposed; and

actuating the splicing means so as to splice the juxtaposed ends;

whereby an endless loop of magnetic tape of said selected length is established in the loop path.

5,066,348

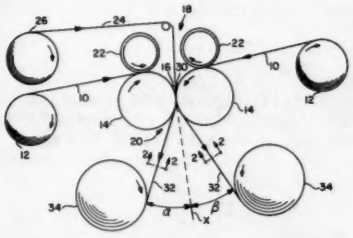
METHOD OF MAKING A FLANNELIZED FILM

James H. Manning, Neenah, Wis., assignor to James River Corporation, Richmond, Va.

Filed Dec. 4, 1989, Ser. No. 445,028

Int. Cl.[5] B32B *31/08*

U.S. Cl. 156—164 **6 Claims**



1. A method of making a flannelized film having a flannel cloth-like texture comprising:

feeding a plurality of layers of plastic film between a plurality of rollers, the rollers meeting at a nip having a feed side and an exit side;

adhering an adhesive onto one surface of each layer of plastic film before the layers of plastic film reach the nip;

laminating a layer of creped tissue comprising a plurality of sinusoidal cellulosic fibers defining a nominal plane between the layers of plastic film, the sinusoidal fibers of said layer of creped tissue coming into contact with the surface of the plastic film having adhered adhesive to form an intermediate laminate structure;

splitting the intermediate laminate structure along the nominal plane of the creped tissue such that said sinusoidal fibers are split into a plurality of U-shaped fibers, a portion of the U-shaped fibers having components extending in a substantially perpendicular direction with respect to the plane of the plastic film to provide the flannel cloth-like texture; and

feeding the split intermediate laminate structure from the exit side of the nip to a plurality of take-up rollers.

5,066,349

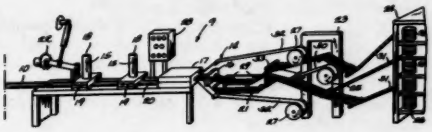
PROCESS FOR PULTRUDING A COMPOSITE SIGN

Jack E. Perko, Cedarburg; Gary J. Wirth, Milwaukee, and Brian A. Foxgrover, Wauwatosa, all of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Division of Ser. No. 283,984, Dec. 16, 1988, Pat. No. 4,935,279, which is a continuation-in-part of Ser. No. 148,824, Jan. 27, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 468,447

Int. Cl.[5] G09F *19/00*; B29C *55/30*

U.S. Cl. 156—166 **10 Claims**



1. A process for making a sign, comprising:

printing a plurality of discrete sign panels;

affixing each sign panel to a fibrous component of the sign to make a longitudinally continuous sign panel subassembly having said plurality of sign panels spaced along the length of said subassembly;

pulling the sign panel subassembly into a die which defines the shape of a desired cross-section for the sign while holding the sign panel subassembly under tension;

saturating the sign panel subassembly with a hardenable resin;

hardening the resin in the die to that the resin retains the shape of the die when it exits the die to form a continuous pultrusion and encapsulate said sign panel subassembly; and

cutting off the pultrusion after it exits the die.

5,066,350

METHOD OF APPLYING A REFRACTORY COATING TO A CONDUIT

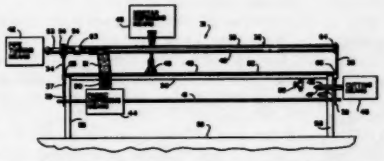
Harry P. Sullins, Blythewood, S.C., assignor to Richland Industrial, Inc., Columbia, S.C.

Continuation of PCT/US88/00029, Jan. 12, 1988, which is a continuation of Ser. No. 903,794, Sep. 4, 1986, Pat. No. 4,729,548, and a continuation-in-part of Ser. No. 887,989, Jul. 25, 1986, Pat. No. 4,802,940, which is a continuation of Ser. No. 521,451, Aug. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 386,638, Jun. 9, 1982, abandoned. This application Dec. 15, 1988, Ser. No. 349,735

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[5] B65H *81/00*

U.S. Cl. 156—187 **15 Claims**



1. A method for applying a refractory coating to an elongated conduit, said method comprising:

mounting said conduit for axial rotation relative to a trough containing a liquid refractory coating composition;

passing a web of porous material from a web dispensing means through said trough in a position below the surface of said liquid to coat said web with said liquid;

securing said web to said conduit by placing a leading end portion of said web against said conduit to extend longitudinally along a portion of the outer surface of said conduit, wrapping an adjacent portion of said web around said conduit so that said leading end portion crosses under a first complete turn of said adjacent portion and extends beyond said first turn and between an edge of said first turn and an opposing edge of a second complete turn of said adjacent portion, and tensioning said web such that said adjacent portion of the web is drawn tightly around said conduit, the tensioning of said web causing said leading end portion to be tucked tightly under said first turn and to be engaged between said edge of said first turn and said opposing edge of said second turn so as to secure the beginning of a wrapping of said web to said conduit;

turning said conduit to pull said secured web from said web dispensing means and to wrap additional portions of said secured web around said conduit; and,

causing relative movement between said web dispensing means and said turning conduit in a direction parallel to the axis of said conduit to provide on the outer surface of said conduit a coating in the form of tightly wound spiral windings of said coated web extending along a coated length of said conduit.

5,066,351

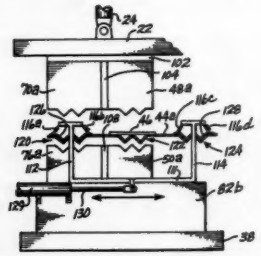
HOT/COLD PRESS FORMING METHODS FOR SHAPING THERMOFORMABLE MATERIALS

Frederick L. Knoll, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 233,639, Aug. 18, 1988, Pat. No. 4,948,355, which is a continuation-in-part of Ser. No. 52,622, May 20, 1987, Pat. No. 4,789,328. This application May 31, 1990, Ser. No. 531,998

Int. Cl.[5] B29C *31/08, 31/10, 51/20, 51/42*

U.S. Cl. 156—212 **55 Claims**



1. A method of forming and shaping a workpiece made of thermoformable material using a first pair of forming means at a first temperature and a second pair of forming means at a second temperature, which comprise the steps of:

(a) providing a tray means suspended in midair by suspension means;

(b) loading said workpiece made of thermoformable material on said tray means suspended in midair;

(c) moving said first pair of forming means horizontally into position above said workpiece and below said tray means;

(d) closing said first pair of forming mean against said workpiece and said tray means to heat said workpiece and to form and shape said workpiece into a formed workpiece of desired configuration;

(e) opening said first pair of forming means and moving said first pair of forming means horizontally away from said formed workpiece and said tray means;

(f) moving said second pair of forming means horizontally into position above said formed workpiece and below said tray means;

(g) closing said second pair of forming means against said formed workpiece and said tray means to cool said formed workpiece while maintaining said formed workpiece in the desired configuration; and

(h) opening said second pair of forming means and unloading said formed and cooled workpiece.

5,066,352

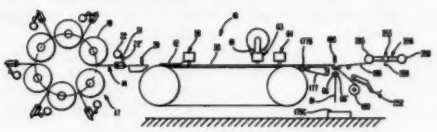
METHOD AND APPARATUS FOR FORMING COMPOSITE PIECES FROM COMPOSITE SHEET MATERIAL

Stephen J. Albers, Norwood; Michael N. Grimshaw; David A. Peterson, both of Milford; John H. Pugh, Mt. Carmel, and Jerry D. Wisbey, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 23, 1990, Ser. No. 484,728

Int. Cl.[5] B32B *31/00*

U.S. Cl. 156—265 **6 Claims**



1. A method for producing shaped composite pieces from composite sheet material including:

transporting composite sheet material from a supply source to a cutting position;

cutting the composite sheet material at the cutting position into segments;

transporting each of the cut segments of the composite sheet material to a support for supporting each of the cut segments;

cutting each of the cut segments of the composite sheet material supported by the support into at least one piece having any selected shape;

advancing each of the pieces having a selected shape from the support;

and separating each of the pieces having a selected shape from the remainder of each of the cut segments of the composite sheet material after advancement from the support.

5,066,353

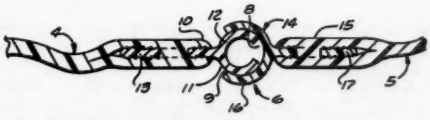
RETAINING WALL EMPLOYING FIBERGLASS PANELS FOR PREVENTING EROSION OF A SHORELINE AND METHOD FOR FABRICATING THE SAME

John L. Bourdo, Phoenix, Ariz., assignor to Durashore, Inc., Phoenix, Ariz.

Filed Sep. 21, 1990, Ser. No. 586,244

Int. Cl.[5] B32B *1/10;* **E02D** *5/02*

U.S. Cl. 156—300 **3 Claims**



1. A process of manufacture for a bulkhead retaining wall panel including the steps of:

a) emplacing a first layer constituting a mixture of fiberglass and curable resin on a support medium, said first layer, when emplaced, having a top edge boundary; a bottom edge boundary; a first side edge boundary; a second side edge boundary; a first face; and a second face;

b) positioning an elongated male interlocking unit along said first side edge boundary of said first layer, said male interlocking unit being characterized by a cross sectional shape which includes a male interlocking portion and a tail portion, said male interlocking unit being positioned such that only its tail portion overlays said first face of said first layer;

c) positioning an elongated female interlocking unit along said second side edge boundary of said first layer, said female interlocking unit being characterized by a cross sectional shape which includes a female interlocking portion and a tail portion, said female interlocking unit being positioned such that only its tail portion overlays said first face of said first layer; claim 5 cont.

d) emplacing a second layer constituting a mixture of fiberglass and curable resin over said first layer, said second layer having a top edge boundary; a bottom edge boundary; a first side edge boundary; a second side edge boundary; a first face; a second face; and substantially the same dimensions as said first layer; such that said top, bottom and first and second side edge boundaries of each said layer are coextensive with said second face of said second layer overlaying said first face of said first layer whereby the tail portions of said male and female interlocking units are captured therebetween; and

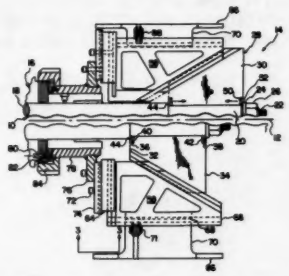
e) allowing the assembly effected during steps A), B), C) and D) to cure.

5,066,354

BUILDING DRUM FOR A TIRE BELT-TREAD STOCK PACKAGE

Gary H. Benjamin, Kenton, Ohio, assignor to Cooper Tire and Rubber Company, Findlay, Ohio

Filed May 25, 1990, Ser. No. 529,091
Int. Cl.[5] B29D *30/24*
U.S. Cl. 156—414 **10 Claims**



1. A tire building drum with an expandable and contractible building surface comprising:

means defining a centerline for the building drum;

an adjusting member including a cone surface coaxially positioned about said centerline;

means for axially advancing and retracting said adjusting member along said centerline;

a plurality of slides and means supporting and constraining said slides for movement radially of said centerline, said slides having slidable connections to said cone surface;

a drum segment connected to each said slide and cooperating to define a building surface on the drum;

whereby said slides are mechanically connected for movement radially with respect to said centerline in response to motion of said adjusting member axially of said centerline to expand and contract the effective building surface of the drum;

a plurality of annular shoe members each supporting one of said drum segments, each said shoe member having an adjustable mounting to one of said slides;

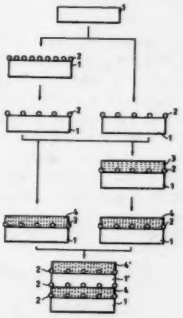
said annular shoe members each having complementary scalloped first and second edges transverse to the building surface such that said scalloped edges of adjacent said shoe members cooperate with each other to provide partial building surface continuity as the shoe members are concurrently moved in and out to different locations along radii of the drum.

5,066,355

METHOD OF PRODUCING HETERO STRUCTURE

Masanobu Miyao; Kiyokazu Nakagawa, both of Saitama; Kiyonori Ohyu, Tokyo; Eiichi Murakami, Tokyo, and Takashi Ohshima, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 16, 1989, Ser. No. 438,290
Claims priority, application Japan, Nov. 19, 1988, 63-291101
Int. Cl.[5] C30B *23/02, 25/14*
U.S. Cl. 156—612 **7 Claims**



1. A method of producing a hetero structure, comprising the steps of depositing hydrogen atoms or halogen atoms onto a surface of a first single crystal layer formed of semiconductor or metal silicide, and forming a second single crystal layer on said first single crystal layer by hetero epitaxial growth, said second single crystal layer being formed of semiconductor or metal silicide having a different lattice constant from the lattice constant of the material forming said first single crystal layer, wherein both of said steps are continuously conducted without taking said hetero structure out of a producing apparatus.

5,066,356

HYDROTHERMAL PROCESS FOR GROWING OPTICAL-QUALITY SINGLE CRYSTALS

August Ferretti, Wilmington, Del., and Thurman E. Gier, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

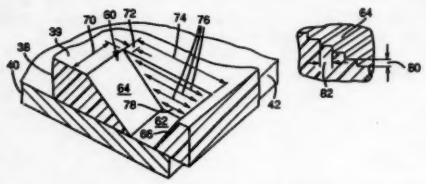
Filed Jan. 5, 1990, Ser. No. 461,562
Int. Cl.[5] C30B *7/10*
U.S. Cl. 156—623 R **20 Claims**

1. An improved hydrothermal process for growing a crystal of $MTiOXO_4$, wherein M is selected from the group consisting of K, Rb, Tl and NH_4 and mixtures thereof and X is selected from the group consisting of P and As and mixtures thereof, at an elevated temperature in a pressure vessel which has a growth region wherein said crystal grows and a nutrient region containing nutrient for growing said crystal; said process employing an aqueous mineralizer solution and a growth region temperature which is lower than the nutrient region temperature, the improvement comprising employing an aqueous mineralizer solution in which the concentration of M is at least about 8 molar, and is 20 molar or less, and also employing a nutrient region temperature of about 450° C. or less during crystallization.

5,066,357
METHOD FOR MAKING FLEXIBLE CIRCUIT CARD WITH LASER-CONTOURED VIAS AND MACHINED CAPACITORS

John B. Smyth, Jr., and Ellen R. Tappon, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 11, 1990, Ser. No. 463,695
Int. Cl.[5] B44C *1/22;* B29C *37/00*
U.S. Cl. 156—643 25 Claims



1. A method of forming a circuit conductor on an upper surface of a polymer substrate, the method comprising:

forming a trench in the substrate having a base spaced a predetermined distance below the substrate upper surface;

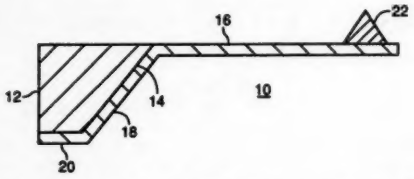
contouring the trench to include at least one lengthwise end wall defining a ramp extending at an obtuse angle between the substrate upper surface and the base of the trench; and

depositing and patterning an upper conductive layer to form a line trace including portions extending lengthwise continuously over a portion of the substrate upper surface, down the ramped end wall and along the base of the trench.

5,066,358
NITRIDE CANTILEVERS WITH SINGLE CRYSTAL SILICON TIPS

Calvin F. Quate, and Marco Tortonese, both of Stanford, Calif., assignors to Board of Trustees of the Leland Stanford Juninor University, Stanford, Calif.

Filed Oct. 27, 1988, Ser. No. 427,788
Int. Cl.[5] G01B *5/28;* H01L *21/306*
U.S. Cl. 156—647 12 Claims



1. A method of forming a microfabricated cantilever with an integral silicon tip at the free end thereof, comprising the steps of:

providing a (100) silicon substrate having a top surface and a bottom surface;

providing a top layer of doped silicon material on the top surface of said silicon substrate;

forming a top layer of silicon dioxide on the top layer of doped silicon material;

patterning and etching said top layer of silicon dioxide to provide a tip mask for subsequent formation of a silicon tip in said top layer of doped silicon material;

patterning and etching a top portion of the silicon substrate immediately beneath the top layer of doped silicon material and the top layer of doped silicon material so as to define a cantilever pattern with the tip mask being positioned to be near a free end of a cantilever to be subsequently formed;

forming a bottom layer of silicon dioxide on the bottom surface of said silicon substrate;

patterning and etching said bottom layer of silicon dioxide to define a masking aperture in the bottom silicon dioxide layer;

anisotropically etching said silicon substrate from the bottom surface of said silicon substrate through said masking aperture, said anisotropic etching stopping at the top layer of doped silicon material layer to release a cantilever free end of the patterned top layer of doped silicon material from the silicon substrate, said anisotropic etching removing all of the crystal planes of the silicon substrate except the (111) planes to leave a silicon base having an oblique surface and from which extends the free end of the top layer of the doped silicon material as a doped silicon cantilever member;

removing the bottom layer of silicon dioxide;

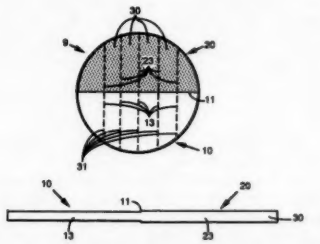
forming a layer of nitride over a bottom surface of the doped silicon cantilever member and the bottom and oblique surfaces of the silicon substrate to form a nitride cantilever beneath the doped silicon layer;

selectively removing the top layer of doped silicon material with the tip mask thereupon to form a pointed silicon tip beneath said tip mask near the free end of the nitride cantilever and to provide a nitride cantilever having an integrally formed silicon tip at the free end thereof.

5,066,359
METHOD FOR PRODUCING SEMICONDUCTOR DEVICES HAVING BULK DEFECTS THEREIN

Herng-Der Chiou, Tempe, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1990, Ser. No. 577,183
Int. Cl.[5] H01L *21/306;* B44C *1/22*
U.S. Cl. 156—651 16 Claims



1. A method for fabricating semiconductor devices or circuits having bulk defects therein, comprising:

providing a highly doped N-type semiconductor wafer containing a dissolved precipitatable impurity and having opposed principal surfaces;

lapping one or more surfaces leaving lapping damage therein;

etching the lapped surface to remove some but not all of the lapping damage;

heating the wafer to create bulk defects by lapping damage enhanced precipitating of the dissolved impurity; and thereafter

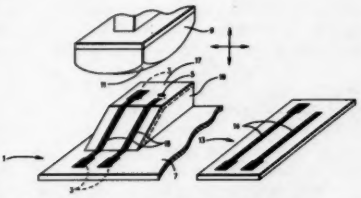
etching the lapped surface to remove the remaining lapping damage.

5,066,360

PAD PRINTING OF RESIST OVER VIA HOLES

Lawrence R. Daley, and Gerald G. Leslie, II, both of Lexington, Ky., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 24, 1990, Ser. No. 586,923
Int. Cl.[5] B44C *1/22*; C23F *1/02*
U.S. Cl. 156—660 6 Claims



1. A method of electrical circuit manufacture comprising applying a resist material to a transfer surface in a pattern, moderately hardening said applied resist material, transferring said pattern by applying said transfer surface to a metalized circuit board having at least one metalized via at a position at which said pattern covers said via, further hardening said resist material in a pattern defining an electrical circuit and covering said via, and then forming a circuit pattern by etching said circuit board carrying said further-hardened resist material while said via is protected from being etched by said resist material covering said via.

5,066,361

METHOD AND PRODUCT FOR IMPROVED GLASS FIBER REINFORCED AND FILLED THERMOPLASTIC AND THERMOSETTING RESIN SYSTEMS

Jonathan Scharf, 364-A7 St. Andrews Rd., Glenmoore, Pa. 19343

Filed May 15, 1990, Ser. No. 524,402
Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—663 19 Claims

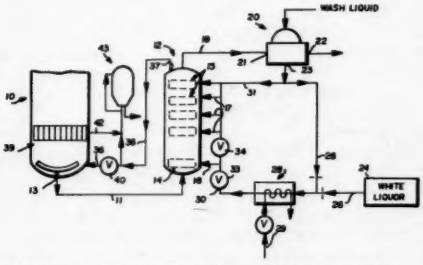
1. A method of providing improved glass fiber reinforced and filled resin systems, comprising the steps of:
etching the glass fiber material;
silanating the etched glass fiber material; and
applying a resin to the etched silanated glass fiber material.

5,066,362

EXTENDED DELIGNIFICATION IN PRESSURE DIFFUSERS

Michael D. Meredith, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Dec. 1, 1987, Ser. No. 127,055
Int. Cl.[5] D21C *3/26*
U.S. Cl. 162—17 5 Claims



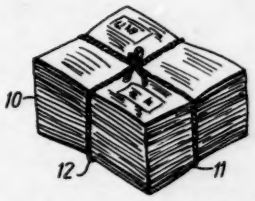
1. A method for effecting extended kraft delignification of pulp, comprising the steps of sequentially: (a) kraft cooking comminuted cellulosic fibrous material to produce kraft pulp in a continuous digester, the pulp from the digester having a blow temperature of over about 300° F.; (b) immediately after step (a), replacing the water around the pulp fibers with delignifying liquor having less than 12% dissolved solids, at least 2 gm/l effective alkali (Na_2O) concentration, and a temperature of at least about 300° F., so that the K-number of the pulp is significantly reduced; and (c) washing the pulp; and (d) adjusting the temperature or flow of the delignifying liquid with respect to the blow temperature of the pulp so as to optimize K-number reduction.

5,066,363

METHOD OF FORMING PULP BALES WITH DISSOLVABLE PVA BALING STRAP MATERIAL

Richard P. Lee, Hagerstown, Md.; Joseph F. Ley, DePere, Wis., and John A. Mortensen, Little Silver, N.J., assignors to C. M. Offray & Son, Inc., Chester, N.J.

Filed Aug. 3, 1990, Ser. No. 562,677
Int. Cl.[5] D21H *11/00*
U.S. Cl. 162—100 10 Claims



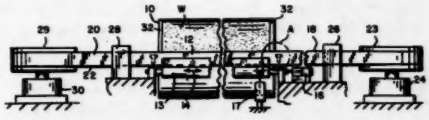
1. The method of handling and processing a bale of paper pulp laps which comprises binding a bale with one or more discrete straps, said straps comprising elongate increments of PVA yarns, PVA filaments or PVA strips maintained in mutually spaced condition, and thereafter immersing said bale in a pulping bath while still constrained by said strap or straps, whereby said PVA increments dissolve in said bath.

5,066,364

BLADE EDGE LOADING CONTROL FOR PULL THROUGH DOCTOR BLADE TRANSFER SYSTEM

Ronald F. Goodnow, Leicester, and Robert A. Reid, Charlton City, both of Mass., assignors to Thermo Electron-Web Systems, Inc., Auburn, Mass.

Filed Jun. 5, 1990, Ser. No. 533,289
Int. Cl.[5] B08B *1/02*; D21G *3/00*
U.S. Cl. 162—281 10 Claims



1. Apparatus for doctoring a moving surface having two lateral sides, said apparatus comprising: a flexible elongated doctor blade having a length greater than the width of said surface; a blade holder for supporting an intermediate portion of said blade at a location spanning the width of said surface; means for reciprocating said blade holder; means coacting with the reciprocation of said blade holder for shifting said blade longitudinally through said blade holder and across said surface from one side to the other side thereof; means for urging said blade holder in one direction to apply a loading force to the intermediate portion of said blade, thereby pressing a working edge of said blade against said surface; and adjustable

means acting on said blade to relieve said loading force along the sides of said surface.

5,066,365

PROCESS FOR THE ISOLATION OF VINYL ACETATE BY DISTILLATION

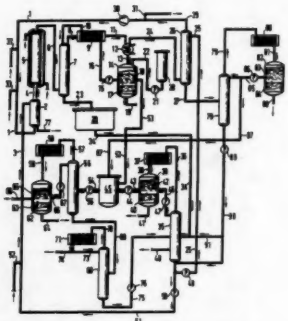
Günter Roscher, Kelkheim; Karl-Heinz Schmidt, Idstein/-Taunus; Klaus Eichler, Eschborn; Peter Hörstermann, Königstein/Taunus; Reinhard Gradl, Erftstadt, and Horst Langner, Hattersheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 15, 1990, Ser. No. 597,572

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1989, 3934614

Int. Cl.[5] B01D *3/00;* **C07C** *67/54*

U.S. Cl. 203—042 **6 Claims**



1. A process for the isolation of vinyl acetate from a gas mixture containing vinyl acetate, ethyl acetate, acetic acid, water and carbon dioxide and being formed in the reaction of ethylene with acetic acid and oxygen in a reaction zone in the gas phase over catalysts containing palladium or palladium compounds, in which process

a) the gas mixture leaving the reaction zone is passed into a first distillation column yielding a gas mixture as a head product, and a product containing vinyl acetate, ethyl acetate, acetic acid, and water as a bottom product,

b) the gas mixture leaving at the head of the first distillation column is cooled to −20° C. to +50° C., as a result of which a condensate is formed from some portion of said gas mixture and then separates into an aqueous and an organic phase, while some portion of said gas mixture is not condensed,

c) the aqueous phase formed in step b) is removed,

d) the organic phase formed in step b) is reintroduced completely or in part as reflux at the head of the first distillation column used in step a) and any portion of the organic phase not used as reflux is removed,

e) said portion of the gas mixture not condensed in step b) and containing vinyl acetate is washed in a washing column with at least 90% aqueous acetic acid to give an acetic acid solution containing vinyl acetate at the bottom,

f) the bottom product of step a) containing vinyl acetate, ethyl acetate, acetic acid and water is passed to a second distillation column yielding a head vapor product and a bottom product and a side-stream containing ethyl acetate is removed from a concentration zone above the bottom thereof,

g) the bottom product of step f) containing acetic acid and water is used completely or in part for the gas washing in step e),

h) the head vapor of the step f) is cooled, as a result of which a condensate is formed and then separates into an aqueous and an organic phase,

i) the aqueous phase formed in step h) is removed,

k) a portion of the organic phase formed in step h) is reintroduced as reflux at the head of the second distillation column used in step f),

l) the remaining portion of the organic phase formed in step h) is removed,

which comprises

m) introducing the bottom product of the washing column used in step e) into a third distillation column yielding a bottom product and a head vapor product,

n) recycling the bottom product of the third distillation column used in step m) into the second distillation column used in step f) or into the washing column used in step e) or into the reaction zone,

o) cooling the head vapor product of stem m), as a result of which a condensate is formed and then separates into an aqueous and an organic phase,

p) removing the aqueous phase formed in step o),

q) re-introducing a portion of the organic phase formed in step o) as reflux at the head of the third distillation column used in step m),

r) passing the remaining portion of the organic phase formed in step o) together with the remaining organic phase removed in step l) and together with any remaining organic phase removed in step d) into a fourth distillation column yielding a head vapor product and a bottom product,

s) cooling the head vapor of step r), as a result of which a condensate is formed and then separates into an aqueous and an organic phase containing low-boiling components,

t) removing the aqueous phase formed in step s),

u) re-introducing the organic phase formed in step s) completely or in part as reflux at the head of the fourth distillation column used in step r) and removing any portion of the organic phase not used as reflux for separating off the low-boiling components,

v) passing the bottom product from step r) into a fifth distillation column,

w) removing pure vinyl acetate at the head of the fifth distillation column used in step v).

5,066,366

METHOD FOR MAKING FOIL

Lifun Lin, Hamden, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed May 4, 1990, Ser. No. 519,529

Int. Cl.[5] C25D *1/04*

U.S. Cl. 204—12 **16 Claims**

1. A process for making ultra-thin foil comprising:

providing a copper or copper alloy foil carrier,

cleaning said carrier,

thereafter treating said carrier with an aqueous solution of chromic acid and phosphoric acid to apply a film on said carrier to render a subsequent deposit of copper or copper alloy foil thereon to be strippable therefrom, and

depositing on said carrier an ultra-thin layer of copper or copper alloy.

5,066,367

LIMITING TIN SLUDGE FORMATION IN TIN OR TIN/LEAD ELECTROPLATING SOLUTIONS

Fred I. Nobel, Sands Point, and Barnet D. Ostrow, Roslyn, both of N.Y., assignors to Learonal Inc., Freeport, N.Y.

Continuation of Ser. No. 396,889, Aug. 22, 1989, which is a continuation of Ser. No. 188,233, Apr. 29, 1988, Pat. No. 4,871,429, which is a continuation of Ser. No. 852,063, Apr. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 778,353, Sep. 20, 1985, Pat. No. 4,617,097, and a continuation-in-part of Ser. No. 564,516, Dec. 22, 1983, Pat. No. 4,599,149, which is a continuation-in-part of Ser. No. 301,390, Sep. 11, 1981, abandoned. This application Sep. 20, 1990, Ser. No. 585,768

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[5] C25C *3/32;* C25D *3/60*

U.S. Cl. 204—44.4 24 Claims

1. A solution for use in the electroplating of tin and tin-lead alloys comprising:

a divalent tin alkyl sulfonate;

an alkyl sulfonic acid in an amount sufficient to lower the pH of the solution to below about 3; and

a reducing agent in an amount sufficient to assist in keeping the tin in the divalent state.

5,066,368

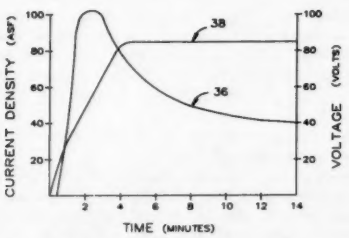
PROCESS FOR PRODUCING BLACK INTEGRALLY COLORED ANODIZED ALUMINUM COMPONENTS

Anthony M. Pasqualoni, Hamden; Deepak Mahulikar, Meriden; Satish K. Jalota, Wallingford, and Andrew J. Brock, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 17, 1990, Ser. No. 568,818

Int. Cl.[5] C25D *11/14*

U.S. Cl. 204—58 18 Claims



1. A process for producing an anodized aluminum component, comprising the steps of:

(a). providing said component to be an aluminum alloy capable of forming a light black to black color by integral color anodization;

(b). anodizing said component in an electrolytic cell suitable for integral color anodization by increasing the cell voltage at a rate effective to increase the current density from zero to over a peak value in excess of about 70 amps per square foot within about 3 minutes; and

(c). then immediately causing said current density to decrease from said peak value while thereafter maintaining a voltage in excess of about 70 volts to form a light black to black integral color anodization layer.

5,066,369

PROCESS FOR PREPARING PARA-AMINOPHENOL

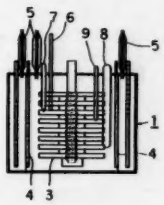
Kyung S. Yun, and Byung W. Cho, both of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Rep. of Korea

Filed Jan. 3, 1990, Ser. No. 460,625

Claims priority, application Rep. of Korea, Sep. 6, 1989, 12903/1989

Int. Cl.[5] C25C *3/00*

U.S. Cl. 204—74 8 Claims



1. A process for preparing para-aminophenol from nitrobenzene comprising the step of:

electrolytically synthesizing the solution of negative electrode compartment having sulfuric acid of 1.5–3.0M and nitrobenzene of 0.5–2.0M with working electrodes of solid polymer electrolyte electrode and multi-rotating disk electrode having a plurality of disk electrodes.

5,066,370

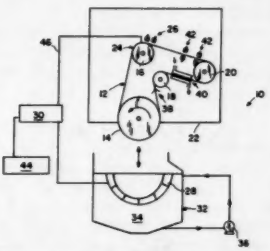
APPARATUS, ELECTROCHEMICAL PROCESS, AND ELECTROLYTE FOR MICROFINISHING STAINLESS STEEL PRINT BANDS

Joseph C. Andreshak, Mahopac; Madhav Datta, Peekskill; Lubomyr T. Romankiw, Briarcliff Manor, all of N.Y., and Luis F. Vega, Simsbury, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1990, Ser. No. 578,971

Int. Cl.[5] C25F *3/00, 3/06, 3/24, 7/00*

U.S. Cl. 204—129.1 29 Claims



9. A method of electrochemically processing an anodic material provided in strip form comprising:

affixing a strip of said material to a means for moving said material at a predetermined speed, said moving means attached to a movable plate;

moving said plate toward a tank positioned at a predetermined distance from said moving means on said movable plate and containing an electrolyte, traversing said predetermined distance between said plate and said tank, so that said material engages said electrolyte in said tank;

triggering movement of said strip of said material on said moving means;

simultaneously triggering operation of a first power supply having a negative pole connected to a cathode assembly mounted to said tank and surrounded by said electrolyte and a positive pole connected to said anodic material at a point of electrical connection;

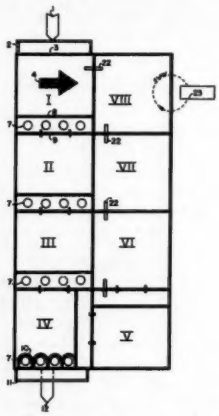
removing said electrolyte from said material after said material engages said electrolyte in said tank;
turning said power supply off;
returning said plate to its original position a predetermined distance away from said tank; and
removing said strip of said material from said moving means.

5,066,371

REMOVAL OF CONTAMINANTS AND RECOVERY OF METALS FROM WASTE SOLUTIONS

Irving W. DeVoe, Thousand Oaks, Calif.; Olwyn A. D'Sylva, Montreal, Canada, and David A. Fine, Santa Monica, Calif., assignors to Metanetix, Inc., Camarillo, Calif.

Filed Feb. 24, 1989, Ser. No. 316,201
Int. Cl.[5] C02F *1/46, 1/42*
U.S. Cl. 204—149 **14 Claims**



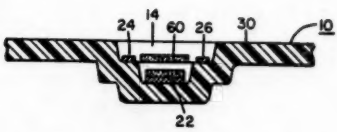
1. A method for removal of at least one contaminant from a liquid containing same, said method comprising:
introducing said liquid containing said contaminant into a first of a plurality of liquid treatment containers;
contacting said liquid in said first liquid treatment container with a first quantity of a solid contaminant recovery medium for removing said contaminant from aid liquid in a liquid-medium suspension for a period of time sufficient to achieve a desired efficiency of recovery of said contaminant;
cycling said liquid from said first liquid treatment container sequentially through each of said plurality of liquid treatment containers to a final liquid treatment container while contacting said liquid in each of said liquid treatment containers with additional quantities of said medium in liquid-medium suspension for period of time sufficient to achieve said desired efficiency of recovery in each of said liquid treatment containers;
cycling at least a portion of said medium from said final liquid treatment container through said plurality of liquid treatment containers to said first liquid treatment container in a direction countercurrent to flow of said liquid so as to maintain essentially a constant medium concentration in each of said liquid treatment containers, said medium being substantially separated from liquid prior to cycling from one container to another container;
transferring at least a portion of said medium from said first liquid treatment container into a medium recycling means comprising a plurality of medium recovery containers wherein said medium is treated with a contaminant recovery liquid for regenerating said medium;
cycling said medium from a first medium recovery container sequentially through said plurality of medium recovery containers to a final medium recovery container;
cycling said contaminant recovery liquid from said final medium recovery container through said plurality of medium recovery containers to said first medium recovery container in a direction countercurrent to flow of said medium through said medium recycling means, whereby said medium is at least partially regenerated; and
reintroducing at least a portion of said at least partially regenerated medium from said final medium recovery container into said final liquid treatment container.

5,066,372

UNITARY MULTIPLE ELECTRODE SENSOR

Howard H. Weetall, Sharon, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 492,369, Mar. 9, 1990, Pat. No. 4,963,245, which is a continuation of Ser. No. 859,128, May 2, 1986, abandoned. This application Jun. 21, 1990, Ser. No. 541,566
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] G01N *27/26, 27/327*
U.S. Cl. 204—153.1 **12 Claims**



1. A method for detection of an analyte in test sample on a unitary electrochemical sensor, the method comprising:
(a) applying a test sample onto a unitary electrochemical sensor, said sensor comprising:
(i) a sensor support member including an electrically non-conductive surface; and
(ii) at least one well deposited on the support member, wherein within each well is deposited an electrode array, the array defining an area on the support member for applying a test sample, the array consisting of a working electrode, a counter electrode and a reference electrode; and wherein the electrodes of the array are spaced from one another horizontally and vertically in said well, and wherein sensor activating chemicals are located on or attached to the working electrode of the array, the sensor activating chemicals comprising an electron transfer mediator, a first conjugate including a specific binding partner for the analyte to be measured, and a second conjugate including a known amount of the said analyte attached to an oxidizing catalyst or oxidizing substrate;
(b) applying an electron source onto the array on which said test sample was applied;
(c) applying a preselected potential between the working electrode and the counter electrode of the array;
(d) measuring the current between the working electrode and the counter electrode of the array; and
(e) determining the amount of the analyte in the test sample from the measurement of the current in step d) relative to the preselected potential of step c).

5,066,373

MONITORING PH IN PHENOL ACETONE

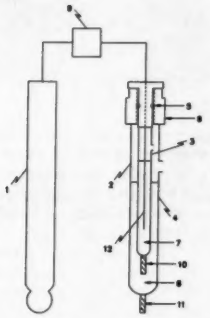
Alan B. Levy, Randolph; Stylianos Sifniades, Madison; Lloyd C. Kent, Pompton Lakes, all of N.J., and Dominick Frollini, Jr., Trafford, Pa., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 28, 1990, Ser. No. 590,251
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—153.21 **16 Claims**

1. In a process for producing phenol by oxidation of cumene

to cumene hydroperoxide followed by an acid catalyzed cleavage of cumene hydroperoxide to an acid cleavage reaction mixture comprising phenol, acetone, alpha-methylstyrene, and cumene, then neutralizing said acid cleavage reaction mixture followed by distillation to recover phenol, said neutralized acid cleavage reaction mixture containing 0–5 weight percent water; the method of monitoring said neutralized acid cleavage reaction mixture for acidity comprising:

immersing a standard hydrogen ion electrode and a double-junction reference electrode in said neutralized acid cleavage reaction mixture and measuring the potential difference between the two electrodes to determine level of acidity;



said double junction reference electrode comprising an inner body containing an inner body solution comprising a standard reference system electrolyte; an outer body containing a homogeneous outer body solution comprising a salt dissolved in a solution of phenol, acetone and water, the phenol to acetone molar ratio being from 1:10 to 10:1, the water being present in an amount of at least 1 weight percent, said salt selected to be neutral, soluble and stable in said outer body solution; a portion of said inner body being immersed in said outer body solution; first junction means disposed on said inner body to permit flow from said inner body to said outer body and second junction means disposed on said outer body to permit flow from said outer body to said neutralized acid cleavage reaction mixture.

5,066,374

ELIMINATION OF FILM DEFECTS DUE TO HYDROGEN EVOLUTION DURING CATHODIC ELECTRODEPOSITION

Mark R. Winkle, Lansdale, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 20, 1990, Ser. No. 585,428

Int. Cl.[5] C25D *13/10*

U.S. Cl. 204—181.4 **6 Claims**

1. A process for reducing pinhole defects in cataphoretically deposited films comprising electrophoretically depositing on a surface a film formed from a polymer composition comprising an aqueous solution or emulsion of at least one polymer and a compound reduced by hydrogen produced during said deposition.

5,066,375

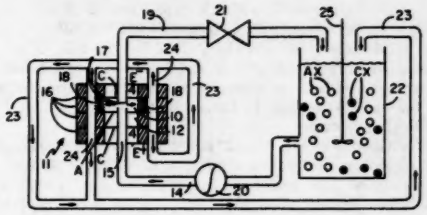
INTRODUCING AND REMOVING ION-EXCHANGE AND OTHER PARTICULATES FROM AN ASSEMBLED ELECTRODEIONIZATION STACK

Edgardo J. Parsi, Lexington; Keith J. Sims, Framingham; Irving D. Elyanow, Somerville, and Thomas A. Prato, Cambridge, all of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Mar. 19, 1990, Ser. No. 495,513

Int. Cl.[5] C02F *1/46*; C25B *1/00*

U.S. Cl. 204—182.4 **20 Claims**



1. An electrodeionization apparatus comprising an assembled ion exchange membrane stack, means for transferring a suspension of ion exchange particulates in a fluid into at least one of the chambers of said ion exchange membrane stack, strainers within said chamber for retaining said particulates within said chamber to at least partially form a packed bed of particulates therein, said chamber further comprising at least one fluid flow path, said path having at least one first channel communicating with a first fluid transfer manifold adapted to transfer fluid into or out of said flow path, said path also having at least one second channel communicating with a second fluid transfer manifold adapted to transfer fluid into or out of said flowpath, said flow path also having at least one flow path width restrictor intermediate between said first channel and said second channel, said restrictor further having at least one third channel communicating with a fluid transfer manifold adapted to transfer fluid into or out of said flow path.

5,066,376

ELECTROPHORESIS MEDIA COMPRISING ACTIVE METHYLENE GROUPS

Hans W. Osterhoudt, Spencerport; Ignazio S. Ponticello, Pittsford; Kenneth G. Christy, Jr., Rochester; Wayne A. Bowman, Walworth, and Jon N. Eikenberry, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 188,821, May 2, 1988. This application Nov. 2, 1989, Ser. No. 430,998

Int. Cl.[5] G01N *27/26*; B01D *57/02*

U.S. Cl. 204—182.8 **11 Claims**

1. A method for preparing an electrophoresis gel medium while minimizing exposure to harmful chemicals which comprises forming a solution of (1) a water soluble, uncrosslinked, non-ionic copolymer of a mixture of uncharged vinyl monomers, said mixture comprising (a) at least about 50% by weight of a monomer selected from the unsubstituted and substituted acrylamide monomers; (b) from about 1% to about 50% by weight of a monomer that contains an active methylene group and (c) from 0 to about 49% by weight of one or more vinyl monomers different from monomers (a) and (b); and (2) an electrophoresis buffer in deionized water employing such proportions of copolymer, buffer and water as to provide a gel of the desired copolymer concentration and pH, providing means with which to form a shaped electrophoresis gel medium of the desired dimensions, adding to said solution of copolymer and buffer that reacts with the functional groups on the repeating units in the copolymer derived from monomer (b) in such concentration of crosslinking agent as to cause gelation to occur within a time period of from about 5 minutes to about 15 hours after said addition, and then promptly em-

ploying said gel shaping means to form the gel medium of desired dimensions from the gel thereby produced.

5,066,377

METHOD AND DEVICE FOR PRODUCING A CONTROLLABLE AND REPRODUCIBLE TEMPERATURE GRADIENT AND USE THEREOF

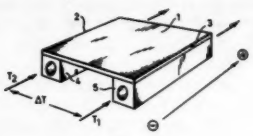
Volker Rosenbaum, Meerbusch, and Detlev Riesner, Düsseldorf, both of Fed. Rep. of Germany, assignors to Diagen Institute für molekularbiologische Diagnostik GmbH, Düsseldorf, Fed. Rep. of Germany

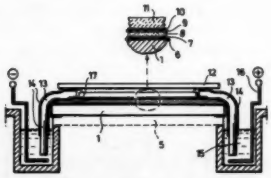
Continuation of Ser. No. 317,058, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 67,882, Jun. 30, 1987, abandoned. This application Jun. 29, 1990, Ser. No. 545,111

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622591

Int. Cl.[5] G01N *27/26;* B01D *57/02*

U.S. Cl. 204—182.8 19 Claims





11. A method for separating a mixture of substances in a sheet-shaped separating medium, comprising:

placing a single heat-conducting plate in thermal connection with the sheet-shaped separating medium at a first surface of said sheet-shaped separating medium and placing insulation means for thermally insulating said sheet-shaped separating medium such that a uniform temperature can be maintained through the sheet-shaped separating medium at a surface of said sheet-shaped separating medium opposite to said first surface;

creating a linear controllable and reproducible temperature gradient across the heat-conducting plate, comprising attaching a first block having a bore therethrough to one edge of the heat conducting plate, connecting a second block having a bore therethrough to an opposing edge of the heat conducting plate, supplying liquid at a first predetermined temperature through the bore of the first block so as to controllably heat said one edge, and supplying liquid t a second predetermined temperature through the bore of the second block so as to controllably cool said opposing edge;

applying an electrical field to said sheet-shaped separating medium to create a potential gradient across said sheet-shaped separating medium; and

causing one substance in the mixture to undergo a thermal conversion within the controllable and reproducible temperature gradient, thereby separating said substances.

5,066,378

ELECTROLYZER

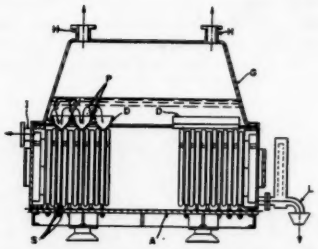
Giovanni Meneghini, Milan, Italy, assignor to DeNora Permelec S.p.A., Milan, Italy

Filed Oct. 3, 1989, Ser. No. 416,719

Claims priority, application Italy, Feb. 13, 1989, 19423 A/89

Int. Cl.[5] C25B *9/00, 11/02, 11/03, 15/08*

U.S. Cl. 204—237 17 Claims



1. In a zero-gap monopolar diaphragm or pocket-type ion exchange membrane electrolyzer for chlor-alkali electrolysis, said electrolyzer comprising cathodic compartments and anodic compartments separated by a diaphragm or pocket-type ion exchange membrane containing respectively box-shaped expanded metal cathodes and anodes having an open structure and elongated in a substantially vertical direction, the improvement comprising at least part of said anodes are provided in the upper part with baffles to generate a plurality of upward recirculation motions of the anolyte-gas mixed phase and downward motions of the gas-free anolyte through electrolyte conveyors to decrease the electrolyzer voltage and to increase the faradic efficiency and the quality of the products, said upward and downward motions localized in separate areas of the anodes, said baffles being provided with upper edges of overflow holes in the lower portion of the baffle.

5,066,379

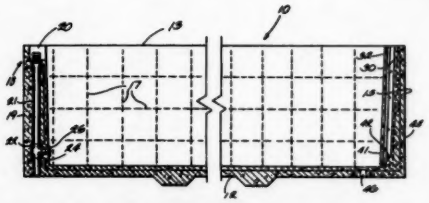
CONTAINER FOR CORROSIVE MATERIAL

John O. Harry; George Verhagen, both of Green Bay, Wis., and Rudy E. Small, Naples, Fla., assignors to Corrosion Technology, Inc., Green Bay, Wis.

Filed Jun. 14, 1990, Ser. No. 538,179

Int. Cl.[5] C25C *7/00;* C25D *17/02*

U.S. Cl. 204—279 25 Claims



1. A container for corrosive electrolyte and used in an electrolytic process, said container consisting of a cured polymer concrete shell having a pair of side walls, a pair of opposed end walls, and a bottom, the improvement comprising an overflow box formed in one side wall and including a recess formed below the upper edge of the one end wall, and including discharge passage means having one end opening in said recess and the other end opening exteriorally of the vessel, second passage means formed in and beneath the surface of the second end wall and extending from the upper end of said wall downwardly to a position adjacent its lower end, said channel defining a vertical passage in the other end wall, said second passage means being open at its upper end and adjacent the bottom of the container.

5,066,380

ELECTROCATALYTIC CATHODES AND METHOD OF PREPARATION

Carl E. Byrd, Richwood; Stephen L. Kelly, Angleton, and Richard N. Beaver, Angelton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 29, 1990, Ser. No. 529,829
Int. Cl.[5] C25B *11/08;* B05D *5/12*
U.S. Cl. 204—290 R 25 Claims

1. A method of making an electrocatalytic cathode comprising contacting at least one surface of a metallic-surfaced substrate with a coating solution having a pH of less than about 2.8, the coating solution comprising a solvent medium, at least one primary electrocatalytic metal ion at a concentration sufficient to deposit an effective amount of at least one primary electrocatalytic metal on the surfaces, and palladium metal ion at a concentration sufficient to promote deposition of the at least one primary electrocatalytic metal in admixture with palladium metal on the surfaces, the contact being conducted under conditions and for a time sufficient to deposit on the surfaces, by non-electrolytic reduction deposition, a hard, substantially continuous and nondendritic coating of the at least one primary electrocatalytic metal and palladium metal as a metal alloy having a substantially uniform composition, the deposition of the at least one primary electrocatalytic metal being increased in comparison to use of an otherwise similar palladium-free coating solution under substantially similar conditions.

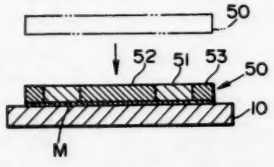
25. A cathode produced according to claim 1.

5,066,381

TARGET UNIT

Kenji Ohta, Kitakatsuragi; Yoshiteru Murakami, Nishinomiya; Nobuyuki Takamori, Nara; Kenichi Hijikata; Takyuki Shingyoji, both of Urawa, and Kazushige Takaishi, Omiya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Mitsubishi Metal Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 338,315, Apr. 14, 1989, abandoned.
This application Oct. 24, 1990, Ser. No. 602,382
Claims priority, application Japan, Apr. 15, 1988, 63-93053; Apr. 15, 1988, 63-93054
Int. Cl.[5] C23C *14/34*
U.S. Cl. 204—298.12 26 Claims



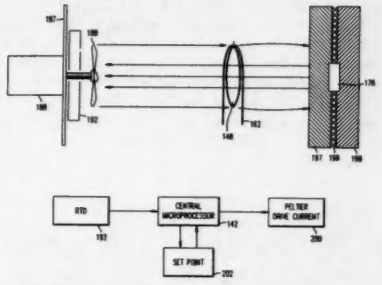
1. A target unit comprising;
a backing plate; and
a target member disposed on said backing plate, said target member including a plurality of erosion members made of a sputtering material and at least one holding member for releasably holding said erosion members on said backing plate, said plurality of erosion members being integrally joined to said holding member by brazing while said holding member is releasably secured to said backing plate.

5,066,382

THERMAL CONTROL FOR CAPILLARY ELECTROPHORESIS APPARATUS

Scot R. Weinberger, and James L. Mills, both of Reno, Nev., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Jan. 25, 1990, Ser. No. 470,280
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—299 R 4 Claims



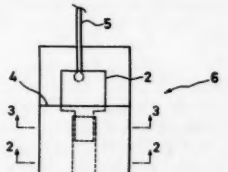
1. A system for controlling temperature in an instrument including a capillary tube holding a sample comprising:
air circulating means for circulating air across the capillary tube;
temperature sensing means for sensing the temperature of the air surrounding the capillary;
resistance sensing means for sensing an electrical resistance of the capillary tube;
heat means for providing heat to and removing heat from the air circulating across the capillary tube; and
control means for receiving the resistance sensed by the resistance sensing means and the temperature of the air surrounding the capillary sensed by the temperature sensing means and controlling the heat means so as to provide more or less heat to maintain the capillary tube at a predetermined temperature.

5,066,383

REFERENCE ELECTRODE, ION SENSOR AND METHOD OF MANUFACTURING THE SAME

Shuichiro Yamaguchi; Takeshi Shimomura; Naoto Uchida, all of Shizuoka; Teruaki Katsube, and Noboru Oyama, both of Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1989, Ser. No. 426,713
Claims priority, application Japan, Oct. 27, 1988, 63-271784; Feb. 6, 1989, 1-28464; Apr. 3, 1989, 1-84551
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—435 18 Claims



1. A reference electrode comprising:
an electrically conductive substrate;
a first film made up of at least two layers provided on a surface of said substrate and including a silver halide layer and a hydrophobic resin layer; and
a second film made up of at least two layers provided on a

surface of said first film and including a hydrophobic resin layer and a salt layer.

5,066,384

PROCESS FOR REFINING COAL-DERIVED HEAVY CARBONACEOUS MATERIALS

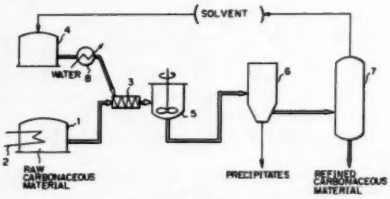
Tohru Iwahashi; Yoshihiko Sunami, both of Ibaraki; Katsumi Satoh, Tokyo; Katsuyuki Ohshima, Ibaraki, and Kenichi Iwaguro, Funabashi, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka; Sumikin Chemical Co. Ltd. and Kureha Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, all of, Japan

Continuation of Ser. No. 37,999, Apr. 14, 1987, abandoned, which is a continuation of Ser. No. 832,704, Feb. 25, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,248

Claims priority, application Japan, Feb. 28, 1985, 60-039349

Int. Cl.[5] C10C *1/18*

U.S. Cl. 208—45 **14 Claims**



1. A process for refining coal-derived heavy carbonaceous materials which comprises the steps of:

providing a coal-derived heavy carbonaceous material from which all the components having normal boiling points of 270° C. or below and all or part of the components having normal boiling points ranging from 270° C. to 360° C. have been removed;

fluidizing the resulting heavy carbonaceous material by heating it to a temperature not lower than 40° C.;

mixing the heated carbonaceous material with a ketone solvent at atmospheric pressure or under pressure for a period sufficient to precipitate coarse insoluble particles in the mixture, said ketone solvent having a normal boiling point of not higher than 200° C. and being used in such an amount that the weight ratio of ketone solvent to carbonaceous material is within the range of from 0.5:1 to 3.0:1;

separating the precipitated particles from the mixture; and

removing the ketone solvent from the mixture, leaving a refined, coal-derived heavy carbonaceous material.

5,066,385

MANUFACTURE OF ISOTROPIC COKE

Lloyd G. Becraft, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Mar. 5, 1990, Ser. No. 489,425

Int. Cl.[5] C10G *31/00*

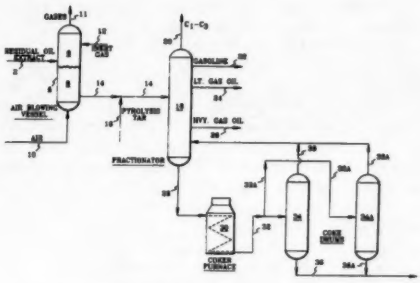
U.S. Cl. 208—131 **8 Claims**

1. A process for producing isotropic coke having reduced sulfur content and a low CTE (coefficient of thermal expansion) ratio from a sulfur-containing residual oil selected from atmospheric and vacuum reduced crudes, which comprises:

(a) contacting the residual oil with an oxygen-containing gas at an elevated temperature to increase the softening point of the residual oil,

(b) combining the oxygen-treated residual oil with up to 50 weight percent pyrolysis tar based on the weight of the combined residual oil and pyrolysis tar, said pyrolysis tar having a lower sulfur content than the residual oil, and

(c) subjecting the combined residual oil and pyrolysis tar to delayed coking to produce isotropic coke in a yield equal to or greater than the yield obtained from the residual oil alone, said coke having a CTE (coefficient of thermal expansion) ratio less than about 1.5 and a sulfur content



lower than the sulfur content of coke obtained from the residual oil alone.

5,066,386

EXTRACTION OF OIL FROM STABLE OIL-WATER EMULSIONS

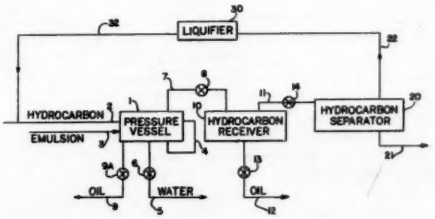
Stephen C. Paspek, North Royalton, and Christopher P. Eppig, Cleveland Hts., both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 343,395, Apr. 25, 1989, abandoned, which is a continuation of Ser. No. 71,433, Jul. 9, 1987, Pat. No. 4,824,555. This application Jun. 14, 1990, Ser. No. 537,877

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[5] C10G *1/00*

U.S. Cl. 208—187 **17 Claims**



1. A process of extracting oil from oil-water emulsions containing suspended solid particulates comprising the steps of:

(A) introducing said emulsion into vessel in an extraction system,

(B) pressurizing the vessel with a volatile hydrocarbon whereby said volatile hydrocarbon is in the liquefied state and forms a two-phase system with said emulsion,

(C) maintaining said pressure for a period of time sufficient to effect the replacement of at least some of the oil in the emulsion phase with said volatile hydrocarbon, the replaced oil being dissolved in the volatile hydrocarbon phase,

(D) withdrawing at least a portion of said oil-containing volatile hydrocarbon phase while maintaining the pressure on the two-phase system,

(E) reducing the pressure on the two-phase system whereby volatile hydrocarbon dissolved in the emulsion is vaporized, and the emulsion separates into a water phase and an oil phase, and

(F) recovering the oil phase from the water phase.

5,066,387

PROCESS FOR REMOVING FINE PARTICLES FROM A POWDER

Marshall E. Deutsch, Sudbury, Mass., assignor to J & S Medical Associates, Inc., Natick, Mass.

Filed Apr. 9, 1990, Ser. No. 506,937
Int. Cl.[5] B03B *1/04*
U.S. Cl. 209—5 4 Claims

1. A process for removing fine particles from larger particles in a powder by rinsing, comprising the steps of:

providing a liquid in a container having upper and lower portions;

adding a quaternary ammonium compound having a charge to said liquid;

placing said powder in said liquid;

reducing the static attraction of said fine particles to said larger particles by the action of said quaternary ammonium compound dissipating static attraction of said fine particles to said larger particles;

settling the larger particles in the lower portion of said container;

suspending the finer particles in said liquid in the upper portion of said container; and

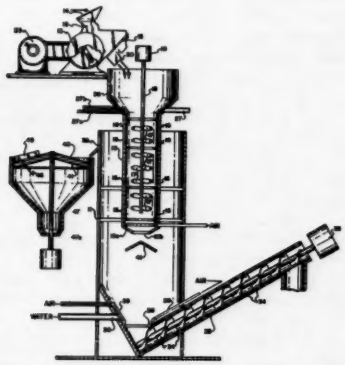
decanting said fine particles in said liquid from the upper portion of said container leaving the larger particles in the lower portion of said container.

5,066,388

PROCESS AND APPARATUS FOR DISENGAGING AND SEPARATING BITUMEN FROM PULVERIZED TAR SANDS USING SELECTIVE COHESION

Lena Ross, 3827 83 Ave., S. E., Mercer Island, Wash. 98040

Filed Feb. 27, 1990, Ser. No. 485,462
Int. Cl.[5] B03D *1/24*; B03B *5/62, 5/64*; C10G *1/00*
U.S. Cl. 209—170 13 Claims



1. Apparatus for disengaging bituminous material from bituminous ores said apparatus comprising

a disengaging chamber means oriented to have a substantially vertical central axis;

means for introducing a mixture of pulverized bituminous ores and water into the disengaging chamber means at an upper end thereof;

means in the disengaging chamber means to agitate the mixture introduced thereinto;

a discharge opening through the lower end of the disengaging chamber means;

a separation vessel receiving the lower end of the disengaging chamber means, said separation vessel having a sidewall extending upwardly to a location above the level of the discharge opening of the disengaging chamber means and having a portion tapered inwardly at a lower end thereof at a level below the said discharge opening;

a deflector distributor means positioned beneath the discharge opening and directing flow from the discharge opening outwardly and downwardly toward the sidewall of the separation vessel;

means for introducing upwardly flowing water into the separation vessel adjacent to the tapered bottom thereof;

an overflow means extending through the sidewall of the separation vessel above the level of the discharge opening;

hopper means containing a plate means having an upper surface which slopes outwardly and downwardly from a central apex, with means to rotate said plate means, said hopper means being positioned to receive said overflow from the overflow means on said rotating plate means, means to maintain the surface receiving overflow at a temperature of between −5 C. and 50° C.;

means to remove adhering bituminous material from the plate means; and

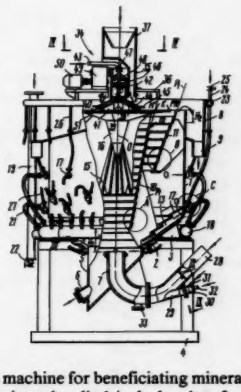
means for removing collected solids from the lower end of the separation vessel.

5,066,389

FLOTATION MACHINE

Mikhail N. Zlobin, ulitsa Pavlova, 12, kv. 1, Mirny; Viktor M. Metsik, Uuitsa Dekabraskikh sobyty, 86, kv. 32; Alexandr A. Nemarov, mikroraion Jubileiny, 91, kv. 36, both of Irkutsk; Georgy P. Permyakov, ulitsa 50 let Oktyabrya, 7, kv. 37, and Nikolai T. Taraban, ulitsa Sovetskara, 15, korpus 2, kv. 15, both of Mirny, all of U.S.S.R.

Filed Sep. 27, 1990, Ser. No. 589,394
Int. Cl.[5] B03D *1/24*
U.S. Cl. 209—170 8 Claims



1. A flotation machine for beneficiating minerals comprising:

a vertically oriented cylindrical chamber for circulating a flotation pulp;

a downwardly tapered bottom connected to said cylindrical chamber;

feed pipe means extending into the downwardly tapered bottom and oriented to open upwardly toward said cylindrical chamber for feeding the flotation pulp containing mineral particles of fine fraction with particles of the useful ingredient of the mineral capable of floating up from the body of said flotation pulp;

discharge pipe means connected to the downwardly tapered bottom near the bottom's lowest point for discharging gangue;

trough means secured at the top part of the cylindrical chamber for collecting a froth concentrate;

a first group of hollow truncated cones positioned axially within said cylindrical chamber and having an upper base and a lower base wherein the diameter of the upper base is larger than the diameter of the lower base and a side tapering downwardly and inwardly from the upper base to the lower base defining a first angle of inclination with

respect to the longitudinal axis of said first group of cones, each of said cones spaced at equal distances from each other and having substantially the same height, wherein the upper bases of the cones face the top part of said cylindrical chamber in a manner such that a plane passing through an edge of each upper base forms a second angle of inclination with respect to the longitudinal axis of the first group of cones and wherein the second angle of inclination is less than the first angle of inclination; and

a seocond group of hollow truncated cones positioned axially at the top part of said cylindrical chamber and lying outside of said first group of cones and having an upper base and a lower base wherein the diameter of the upper base is larger than the diameter of the lower base and a side tapering downwardly and inwardly from the upper to the lower base defining a third angle of inclination with respect to the longitudinal axis of said second group of cones, said second group of cones spaced at equal distances from each other and having substantially the same height, wherein the lower bases of said second group of cones face said tapered bottom in a manner such that a plane passing through the edge of each lower base forms a fourth angle of inclination with respect to the longitudinal axis of the second group of cones and wherein the fourth angle of inclination is greater than the third angle of inclination;

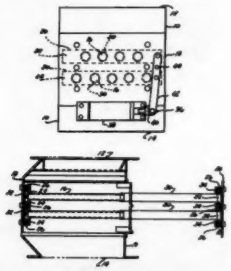
pulp aerator means secured to the walls of said cylindrical chamber for supplying a gas to the flotation pulp; and means positioned over the cylindrical chamber for feeding mineral particles of coarse fraction containing particles capable of staying in the froth layer of pulp to the cylindrical chamber.

5,066,390

MAGNETIC SEPARATOR WITH RECIPROCATING GRATE

Keith J. Rhodes, 8250 Ashare Ct., Clarkson, Mich. 48016, and Scott D. Voorheis, 6611 Balmoral, Waterford, Mich. 48054

Filed Jun. 4, 1990, Ser. No. 532,963
Int. Cl.[5] B03C *1/26*
U.S. Cl. 209—217 **15 Claims**



1. A magnetic separator comprising:

a plurality of elongated magnetic members including least one group of said elongated magnetic members having longitudinal axes lying in at least one common plane with first and second terminal ends;

first end plate means connected to said first terminal end of each of said plurality of elongated magnetic members, said first end plate means adapted for reciprocation in said common plane;

non-magnetic means for sheathing each of said plurality of elongated magnetic members, said non-magnetic means having first terminal ends adjacent said first terminal ends of said elongated magnetic members and second terminal ends adjacent said second terminal ends of said elongated magnetic members, said non-magnetic means adapted for sheathing and unsheathing movement longitudinally along each of said elongated magnetic members;

second end plate means connected to said second terminal ends of each of said non-magnetic means, said second end plate means adapted for reciprocation in said common plane; and

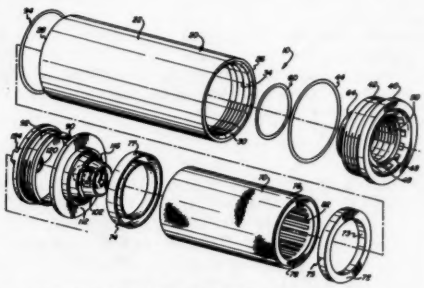
reciprocating means connected to at least one of said first and second end plate means for oscillating a grate assembly defined by said first end plate means and said connected elongated magnetic members and said second end plate means and said connected non-magnetic means, when said non-magnetic means are in a sheathing position over said elongated magnetic members.

5,066,391

REUSABLE LIQUID FILTER ASSEMBLY

Manuel S. Faria, 13897 Road 144, Tipton, Calif. 93272

Filed Aug. 22, 1990, Ser. No. 570,902
Int. Cl.[5] B01D *29/11*
U.S. Cl. 210—85 **3 Claims**



1. A reusable liquid filter assembly, comprising:

a cylindrical housing having a diameter and open ends with bevelled zones adjacent said ends and having internal threading adjacent said bevelled zones;

a first removable end wall having

a cylindrical segment having an external thread for mating with the internal threading of one of said ends of said housing,

an annular channel around the periphery of said cylindrical segment,

a sealing ring for seating in said channel for sealing fit against said bevelled zone of said one end of said housing when said first end wall is threaded together with said housing,

a central threaded outlet port extending through said end wall for discharging liquid,

a plurality of inlet ports located radially about said outlet port and extending through said end wall for receiving liquid into said filter assembly,

an annular projection for extending inwardly into said housing,

a shoulder formed around said annular projection,

a channel formed in said annular projection,

another sealing ring for seating in said channel in said annular projection, and

an annular gasket affixed to an outer surface of said first end wall;

a second removable end wall having

a cylindrical segment having an external thread for mating with the internal threading of the other of said ends of said housing,

an annular channel around the periphery of said cylindrical segment of said second end wall,

a sealing ring for seating in said channel for sealing fit against said bevelled zone of said other end of said housing when said second end wall is threaded together with said housing,

a plurality of struts for extending inwardly into said hous-

ing when said second end wall is threaded together with said housing, and

a closable port extending therethrough;

a filter subassembly having

a cylindrical filter frame having a smaller diameter than the housing diameter and having slots therein,

a filter screen for fitting onto said filter frame, and

a first annular filter end cap for fitting over one end of said filter frame, said first filter end cap being provided with rims around inner and outer peripheral diameters of said first filter end cap, said first filter end cap having an inner diameter sized to be seated on said shoulder of said annular projection, with said inner rim sized for sealing fit against said other sealing ring seated in said channel in said annular projection of said first end wall, and said outer rim sized to snugly receive one end of said filter frame and filter screen;

a second annular filter end cap for fitting over the other end of said filter frame, said second filter end cap being provided with rims around inner and outer peripheral diameters of said second filter end cap, at least one of said struts of said second end wall being sized to press against said second annular filter end cap to retain said filter subassembly in said housing, said outer rim being sized to snugly receive another end of said filter frame and filter screen;

said filter subassembly defining an outer annular chamber between said housing and filter screen for containing liquid to be filtered and an inner chamber within said filter assembly for containing filtered liquid; and

bypass valve means for connecting said inner and outer chambers and set to open at a predetermined pressure differential between said inner and outer chambers, said valve means having a flange, said flange having an annular projection for extending into said housing and centering said inner rim of said second filter end cap of said filter subassembly in said housing, said flange being centered in said housing and retained by said plurality of struts of said second end wall.

5,066,392

APPARATUS FOR MICROBIOLOGICAL DECOMPOSITION OF ORGANIC WASTE

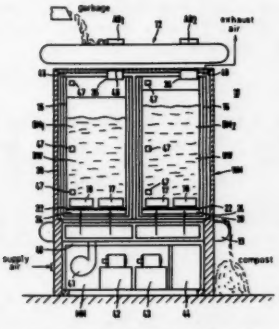
Franz X. Kneer, Am Honigbaum 6, D-6345 Eschenburg-Eibelshausen, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 392,341

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1988, 3827288; Dec. 12, 1988, 3841804

Int. Cl.[5] C02F *11/06*

U.S. Cl. 210—96.1 **17 Claims**



1. An apparatus for the microbiological degradation of a biomass of solid organic waste, comprising:

a vessel containing at least two part vessels positioned side by side, each part vessel containing a portion of said biomass;

a perforated support tray for supporting the biomass;

a gas feed means located below the tray for passing a gaseous medium containing oxygen through the tray and into the biomass within each part vessel, the gas feed means alternately feeding the gaseous medium to each of the part vessels for a preselected time; and

a conveying means for conveying treated biomass from each part vessel, the conveying means being located above the perforated tray.

17. An apparatus for the microbiological degradation of solid organic waste, comprising:

a vessel, which, as a support surface for a biomass of solid organic waste, contains a perforated tray, said vessel being divided into at least two part vessels, each part vessel containing a portion of aid biomass, gas feed means for alternately feeding a gaseous medium through said tray to each of the part vessels for a preselected time, means for determining the organic carbon content of the wasted gaseous medium leaving the vessels, and means for monitoring and maintaining the oxygen content of the gaseous medium fed in at a predetermined value of approximately 12% by volume.

5,066,393

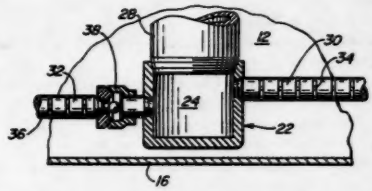
SLOTTED FLOW COLLECTOR/DISTRIBUTOR FOR WATER TREATMENT TANK WITH ONE-WAY VALVES

Robert F. Padera, Libertyville, and Daniel C. Miller, Glenview, both of Ill., assignors to Culligan International Company, Northbrook, Ill.

Continuation-in-part of Ser. No. 400,866, Aug. 28, 1989, abandoned. This application Feb. 23, 1990, Ser. No. 483,810

Int. Cl.[5] B01D *21/24*

U.S. Cl. 210—136 **30 Claims**



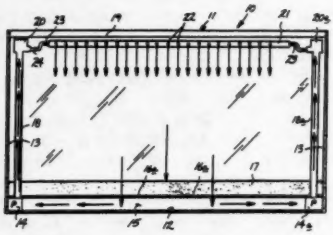
1. A flow collector/distributor for a water treatment tank, which comprises: a tubular housing positioned to provide fluid communication through a wall of a water treatment tank to provide flow communication between the tank interior and the tank exterior, a plurality of slots defined in said tubular housing and positioned to communicate with the tank interior when the collector/distributor is seated in the tank wall, said slots being of a width which is narrow enough to permit water flow therethrough while substantially preventing passage therethrough of water treatment material present within said tank; said slots defining slot portions facing outwardly of said housing that are of less depth than a thickness of a housing wall that defined them, and at least one aperture extending from each of said slot portions completely through said housing wall to provide flow communication between the outer slot portions and the interior of said housing; and one-way valve means permitting water flow through all of said slots from the tank interior through said collector/distributor to the tank exterior, while preventing water flow through some but not all of said slots from the tank exterior through said collector/distributor to the tank interior.

5,066,394

AQUARIUM AERATION AND RECYCLING APPARATUS

Mark R. Harrison, S71 W14976 Westcot Dr., Muskego, Wis. 53150

Filed Jul. 30, 1990, Ser. No. 560,350
Int. Cl.[5] E04H *3/20*; A01K *63/04*
U.S. Cl. 210—169 **7 Claims**



1. An aquarium aeration and recycling apparatus comprising in combination,

an aquarium tank, the aquarium tank including a planar floor, and

plural pairs of spaced planar side walls wherein one of the pairs of the side walls includes a first and second opposed side wall, and

a housing overlying the planar floor, and

the housing including at least one output conduit, and

the housing further including at least one pump member within the housing in operative association with the output conduit, and

a filter member coextensively mounted overlying an upper surface of the housing, and

the upper surface of the housing including a matrix of upper housing apertures directed therethrough to permit fluid flow through the filter member into the housing, and

the aquarium tank including a predetermined quantity of water, the water including a water surface level, and

at least one output conduit mounted to the housing adjacent the first side wall, and

at least one output conduit extending upwardly to the water surface level, and

a circulation tube in fluid communication with at least one output conduit arranged parallel to the planar floor, the circulation conduit including a linear array of circulation tube apertures to direct fluid flow therethrough, and

wherein the circulation tube apertures are positioned adjacent the water surface level and arranged to direct fluid flow parallel to the water surface level.

5,066,395

N-ACYLATED DERIVATIVES OF POLYETHYLENEIMINE BONDED PHASE SILICA PRODUCTS

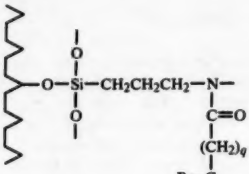
Hugh E. Ramsden, Scotch Plains, and David R. Nau, Lebanon, both of N.J., assignors to J. T. Baker Inc., Phillipsburg, N.J.

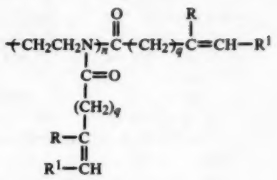
Continuation of Ser. No. 86,617, Aug. 17, 1987, abandoned, which is a division of Ser. No. 943,954, Dec. 22, 1986, Pat. No. 4,721,573, which is a division of Ser. No. 837,051, Mar. 6, 1986, Pat. No. 4,661,248. This application Mar. 13, 1990, Ser. No. 492,219

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 **3 Claims**

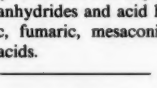
1. An N-acylated derivative of covalently bound, non-cross-linked polyethyleneimine bonded phase silica of the formula:





wherein

is the backbone of a silica gel or glass, n is an integer such that the polyethyleneiminopropyl silane group has an average molecular weight of from about 400 to about 1800; q is an integer of zero or one; R is selected from the group consisting of hydrogen, $-CH_2)_x H$ or $-CH_2)_m$ COOH where x is an integer of 1 or 2 and m is an integer of zero or 1; when R is hydrogen or $-CH_2)_x H$ then R^1 is $-CH_2)_p$ COOH where p is an integer of zero or 1, and when R is $-CH_2)_m$ COOH then R^1 is selected from the group consisting of hydrogen or $-CH_2)_y H$ where y is an integer of zero or 1, and the



acyl group is the acyl residue of an acylating agent selected from the acid, acid anhydrides and acid halides of the group consisting of maleic, fumaric, mesaconic, citraconic, glutaconic and itaconic acids.

5,066,396

TRASH APPARATUS AND COLANDER

Ramon A. Rangel, 815 Screenland Dr., Burbank, Calif. 91505

Filed Dec. 1, 1987, Ser. No. 127,194
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—236 **16 Claims**

1. An apparatus for separating a mixture of articles and materials whereby the articles are retained in the apparatus and the materials are disposed of in operation of the apparatus, comprising

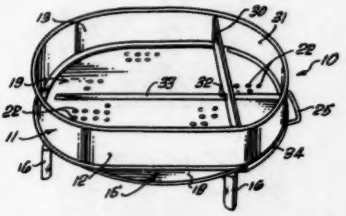
frame means,

a relatively shallow bin fixedly mounted to said frame means and being formed by an endless wall forming a cavity between an open bottom and an open top for the bin,

said frame means being distal from said open top and

adapted for mounting said apparatus upon a receptacle, and

slidable plate means for collecting such mixture when disposed in said bin mounted on said frame means substantially at the bottom of such cavity,



said slidable collecting plate means being slidable on said frame means between a position in alignment with such cavity and an extended position exteriorly of such wall to thereby provide communication between said cavity and receptacle for disposal of such material.

5,066,397

HOLLOW FIBER MEMBRANES WITH FUSION-BONDED END PORTIONS

Yoshihiko Muto, Moriyama; Kohei Watanabe, Fuji; Koichi Yasukata, Fuji, and Tomoyuki Sakurai, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

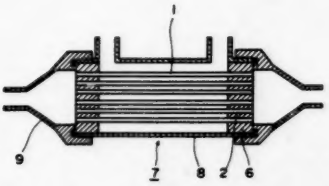
Continuation of Ser. No. 217,782, Jul. 12, 1988, Pat. No. 4,980,060. This application Sep. 21, 1990, Ser. No. 586,234

Claims priority, application Japan, Jul. 13, 1987, 62-174451; Jul. 13, 1987, 62-174453; Feb. 26, 1988, 63-43449

The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[5] B01D *63/02, 71/06*

U.S. Cl. 210—321.61 15 Claims



1. A filter element comprising a plurality of porous hollow fiber filter membranes of a thermoplastic resin, each of which membranes has two end portions and hollows passing therebetween and which are substantially equal in length and arranged in a lengthwise direction,

said membranes each having a porosity of from 30 to 90%,

at least one of said end portions of each of said membranes being directly fusion-bonded at its periphery to form a unified terminal block in which the end portions of said membranes are fluid-tightly bonded together in a fused fashion,

said membranes each being unbonded at portions other than the fusion-bonded end portions,

said unified terminal block having through-holes communicating with the hollows of the unbonded portions of said membranes,

said through-holes having diameters substantially the same as those of the hollows of the unbonded portions of said membranes which hollows communicate with said through-holes.

5,066,398

MEMBRANE FOR A FILTRATION, GAS OR LIQUID SEPARATION OR PERVAPORATION APPARATUS AND A MANUFACTURING METHOD FOR SUCH MEMBRANE

Raymond Soria, Bazet; Corinne Defalque, Tarbes, and Jacques Gillot, Odos, all of France, assignors to Societe Des Ceramiques Techniques, Bazet, France

Filed Jan. 25, 1991, Ser. No. 645,767

Claims priority, application France, Jan. 22, 1991, 91 00679

Int. Cl.[5] B01D *69/10*

U.S. Cl. 210—321.89 25 Claims

1. A membrane for a filtration, gas or liquid separation or pervaporation apparatus comprising at least one porous layer of an inorganic material selected from sintered ceramic, sintered metal, sintered glass or carbon and a separating layer of organic material, the membrane being characterized in that said organic material is a polyphosphazene, in that the average diameter of the pores in said porous layer of inorganic material is between about 5 nm and 1 μm, and in that said separating layer is continuous and only penetrates into said porous layer to a depth of less than five times the diameter of said pores in said porous inorganic layer, said layers being strongly bonded to each other.

5,066,399

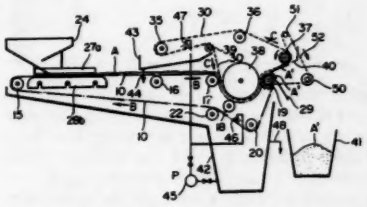
BELT PRESS TYPE DEHYDRATION DEVICE

Kazutoyo Sugihara, 964-38, Niihashi, Gotenba City, Shizuoka Pref., and Yasuhide Kinoda, 2-3-16, Matsugaoka, Kugenuma, Fujisawa City, Kanagawa Pref., both of Japan

Filed May 28, 1986, Ser. No. 868,284

Int. Cl.[5] B01D *33/04*

U.S. Cl. 210—401 4 Claims



1. A belt press type dehydration device comprising:

a plurality of rotatably supported first sprocket rollers having parallel axes;

a plurality of ratatably supported second sprocket rollers having axes parallel to said axes of said first sprocket rollers;

an endless first belt disposed about said first sprocket rollers and drivable in a first closed loop, said first belt comprising an outer first filter sheet layer having two edges and an inner first mesh support layer attached to said edges of said first filter sheet layer;

an endless second belt disposed about said second sprocket rollers and drivable in a second closed loop, said second belt comprising an outer second filter sheet layer having two edges and an inner second mesh support layer attached to said edges of said second filter sheet layer;

means for pressing said first belt and said second belt together;

means for depositing hydrated material on at least one of said filter sheet layers;

means for driving said first and second belts along said first and second closed loops, respectively, from said means for depositing towards said means for pressing, wherein said first and second sprocket rollers are disposed so that a portion of said first belt lies closely adjacent a portion of said second belt and said means for pressing presses these portions together to dehydrate said hydrated material;

wherein said first and second mesh layers each comprise closed loops of interlocked wire;

and wherein said first mesh layer comprises a single closed loop of interlocked wire extending from one edge of said first filter sheet to the other and said second mesh layer comprises two closed loops of interlocked wire, each extending inwardly from said attached edges of said second filter sheet.

5,066,400

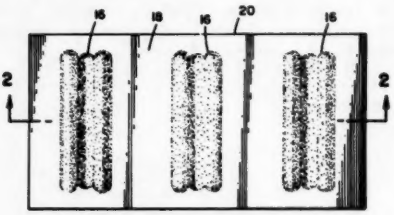
SELF-SPACED PLEATED FILTER

Gary J. Rocklitz; Douglas G. Crofoot, both of Burnsville, and Richard L. Zelinka, Maplewood, all of Minn., assignors to Donaldson Company, Inc., Bloomington, Minn.

Filed Oct. 9, 1990, Ser. No. 595,177

Int. Cl.[5] B01D *27/06, 29/21*

U.S. Cl. 210—493.5 **12 Claims**



1. A pleated filter element comprising:

a sheet of filter media having a plurality of panel sections, each panel section having alternating repeating cycles of formed corrugations and a span of uncorrugated media, each cycle of formed corrugations having at least one complete corrugation and a one-half corrugation end to each cycle.

5,066,401

FLAT OR CAPILLARY MEMBRANE BASED ON A HOMOGENEOUS MIXTURE OF POLYVINYLIDENE FLUORIDE AND A SECOND POLYMER WHICH CAN BE RENDERED HYDROPHILIC BY CHEMICAL REACTION

Heinz-Joachim Müller, Wörth am Main; Heinz-Dieter Sluma, Grossostheim; Günter Eberhard, Erlenbach; Ernst Spindler, Obernburg; Lothar Krauss, Erlenbach, and Helmut Völker, Klingenberg, all of Fed. Rep. of Germany, assignors to AKZO N.V., Netherlands

Filed Jul. 13, 1990, Ser. No. 552,051

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923128

Int. Cl.[5] B01D *71/34*

U.S. Cl. 210—500.35 **10 Claims**

1. A membrane comprising a homogeneous mixture of 70 to 98 percent by weight of polyvinylidene fluoride and 2 to 30 percent by weight of a polymer which can be rendered hydrophilic by chemical reaction formed essentially from poly-

methyl and/or polyethyl acrylate, said membrane having a maximum pore size in the range from 0.005 to 10 μm.

5,066,402

METHOD OF CHANGING OPERATING MODES IN AUTOMATIC WATER FILTERING APPARATUS USING TUBULAR MEMBRANES

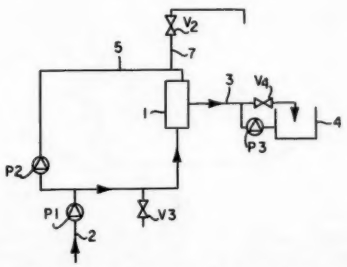
Christophe Anselme, Le Pecq, and Loïc Daniel, Rueil-Malmaison, both of France, assignors to Lyonnaise Des Eaux-Dumez, Paris, France

Filed Oct. 31, 1990, Ser. No. 606,947

Claims priority, application France, Aug. 31, 1990, 90 10864

Int. Cl.[5] B01D *61/20, 29/66*

U.S. Cl. 210—636 **5 Claims**



1. A method of changing operating modes in automatic water filtering apparatus comprising inside-skin tubular membrane modules for filtering water, the possible filtering modes being: dead-end filtering, cross-flow filtering, and cross-flow filtering with continuous purging, both cross-flow filtering modes including recirculation in a loop; comprising the stages of

(A) providing two types of triggering for filter membrane backwashes, a first one of said types being related to time periods between two backwashes, which time periods are predetermined for each mode of filtering, and a second one of said types being related to reference values of an operating parameter of the automatic apparatus, which reference values are predetermined for each mode of filtering; and

(B) changing the mode of filtering after a backwash has been triggered in response to one of said reference values, with changes taking place in the following order: dead-end

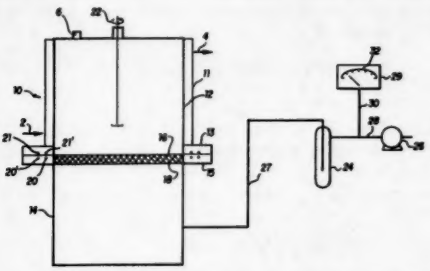
filtering, cross-flow filtering, cross-flow filtering with continuous purging, or vice versa.

5,066,403

PROCESS FOR SEPARATING AZEOTROPIC OR CLOSE-BOILING MIXTURES BY USE OF A COMPOSITE MEMBRANE, THE MEMBRANE, AND ITS PROCESS OF MANUFACTURE

Binay K. Dutta, Calcutta, India, and Subhas K. Sikdar, Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Jul. 12, 1990, Ser. No. 551,342
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—638 **18 Claims**



1. An integral composite pervaporation membrane exhibiting high pervaporation flux comprising a porous hydrophobic polytetrafluoroethylene matrix substrate having adhered to at least one side thereof a thin ion exchange membrane.

5,066,404

METHOD FOR SEPARATING SODIUM AND POTASSIUM BY ION EXCHANGE

Yu Komatsu; Yoshinori Fujiki, and Takayoshi Sasaki, all of Tsukuba, Japan, assignors to National Institute for Research in Inorganic Materials, Tsukuba, Japan

Filed Sep. 7, 1990, Ser. No. 578,415
Claims priority, application Japan, Jan. 5, 1990, 2-883
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—670 **2 Claims**

1. A method for separating sodium and potassium ions from an aqueous solution containing ions of these metals, which comprises selectively ion-exchanging sodium and potassium ions with fibrous crystal titania hydrate having the formula $TiO_2 \cdot nH_2O$ where $n=0.5$ to 2 obtained by subjecting potassium titanate to a potassium-removal treatment, followed by an ion exchange reaction at a temperature of from 25° to 80° C. to desorb and purify sodium and potassium ions.

5,066,405

METHOD FOR ABSORBING PETROLEUM BASED PRODUCTS

Jack L. Liston, 2627 E. North La., Phoenix, Ariz. 85028; Michael Pipella, 4839 E. Greenway, Scottsdale, Ariz. 85254, and Pete Bathemes, 1286 E. Woodridge Cir., Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 374,189, Jul. 3, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 498,027
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—693 **2 Claims**

1. A method for absorbing oils and petroleum-based products from a body of water, said method comprising the steps of:

selecting a liquid anti-static polyurethane foam material;

allowing said liquid foam material to rise;

sprinkling a hydrophobic amorphous silicate powder over said liquid foam as it rises;

allowing said liquid foam material to harden;

placing the hardened foam material in said body of water in contact with said oils and petroleum-based products; and

allowing said foam material to absorb said oils and petroleum-based products.

5,066,406

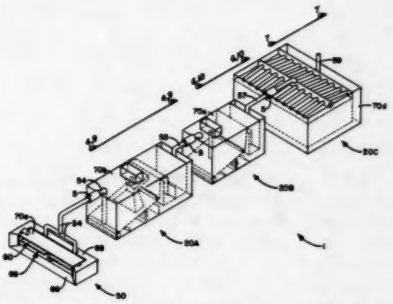
Patent Not Issued For This Number

5,066,407

PETROCHEMICAL RECOVERY MACHINE

George R. Furlow, 37,607 New River Rd., Geismar, La. 70734

Filed Jul. 16, 1990, Ser. No. 553,910
Int. Cl.[5] E02B *15/04;* **C02F** *1/40*
U.S. Cl. 210—744 **28 Claims**



28. A method for separating immimscible liquids having different densities, comprising the steps of:

(a) providing an external housing and an intake line for the liquids;

(b) conveying the liquids through the intake line to a substantially horizontal, slotted distribution manifold larger in cross section than the intake line, and being constructed and arranged to direct the liquid flow slightly downward;

(c) distributing the liquids through the distribution manifold uniformly across the lower portion of the housing;

(d) conveying the liquids above a first baffle downstream of the distribution manifold, the first baffle being constructed and arranged as a compound overflow solid baffle having a lower vertical plate and an oblique upper plate, the lower vertical plate being secured to the bottom and side walls of the housing, the upper plate generally directed toward the distribution manifold, the height of the baffle being approximately equal to the height of the liquid stream leaving the slotted distribution manifold, the first baffle being constructed and arranged to change the direction of flow of the liquid stream to reverse and upward directions, thereby dividing the stream into an upper stream enriched in the less-dense liquid and a lower stream enriched in the more-dense liquid;

(e) discharging the stream enriched in the less-dense liquid; and

(f) separately discharging the stream enriched in the more-dense liquid.

5,066,408

MEANS AND METHOD TO TREAT SWIMMING POOL WATER

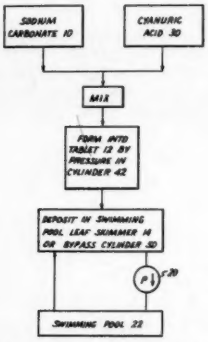
Jonathan S. Powell, 5094 Tip Top Rd., Mariposa, Calif. 95338

Filed Mar. 15, 1990, Ser. No. 493,801
Int. Cl.[5] C02F *1/66*
U.S. Cl. 210—765 **13 Claims**

3. A method of treating swimming pool water, containing calcium ions, comprising:

adding a quantity of sodium carbonate that will precipitate calcium carbonate if directly added to said pool water in

excess of the solubility of sodium carbonate in said pool water to a quantity of cyanuric acid and mixing said quantity of sodium carbonate with said quantity of cyanuric acid before putting them in contact with the pool water and forming the mixture under pressure into tablets consisting essentially of said sodium carbonate and said cyanuric acid and providing a receptacle and a pump therefor


SODIUM CARBONATE 10
CYANURIC ACID 30
MIX
FORM INTO TABLET 12 BY PRESSURE IN CYLINDER 42
DEPOSIT IN SWIMMING POOL LEAF SKIMMER 14 OR BYPASS CYLINDER 50
P
20
SWIMMING POOL 22

so that water from said pool flows into said receptacle and said pump returns water from said receptacle to said pool and placing said tablets in said receptacle so that said tablets absorb water and said sodium carbonate and said cyanuric acid chemically react to form mono sodium isocyanurate, and permitting said tablets to dissolve into water passing through said receptacle.

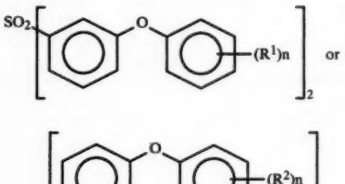
5,066,409

NOVEL ARYL ETHER SULFONES

Bassam S. Nader, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 12, 1990, Ser. No. 581,616
Int. Cl.[5] C07C *147/10;* C10M *1/42*
U.S. Cl. 252—48.2 **21 Claims**

1. A compound of the following formula:



wherein R^1 is independently in each occurrence hydrogen, hydroxyl, alkyl, alkoxy, aryl, aryloxy, polyhaloaryl, polyhaloaryloxy, polyhaloalkylaryl, or polyhaloalkylaryloxy, R^2 is independently in each occurrence alkyl, alkoxy, aryl, aryloxy, polyhaloaryl, polyhaloaryloxy, polyhaloalkylaryl, or polyhaloalkylaryloxy, and n is a whole number from 1 to 5.

5,066,410

REFRIGERATING MACHINE COMPOSITION COMPRISING A FLUORINE-CONTAINING POLYETHER OIL

Yukio Omure, Takatsuki; Katsuki Fujiwara, Suita; Tatsumi Tsuchiya, Moriguchi; Satoshi Hishida, Takaishi; Masahiro Noguchi, Moriguchi, and Ikuo Yamamoto, Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed May 1, 1990, Ser. No. 517,329
Claims priority, application Japan, May 2, 1989, 1-112987; Oct. 11, 1989, 1-265609
Int. Cl.[5] C09K *5/00*
U.S. Cl. 252—68 **3 Claims**

1. A refrigerating machine composition comprising a hydrogen-containing halogenated hydrocarbon as a refrigerant and a machine oil, wherein the machine oil comprises a fluorine-containing polyether having repeated structure units represented by the formula (I)

$$-(CF_2CF_2CF_2O)_l(CHFCF_2CF_2O)_m(CH_2CF_2CF_2O)_n \quad (I)$$

wherein l, m and n are all an integer of at least zero, and satisfying the relationship represented by

$$2 \leqq l + m + n \leqq 200$$

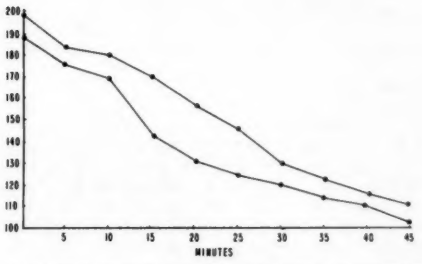
$$60 \leqq \frac{m + 2l}{(l + m + n) \times 2} \times 100 \leqq 95$$

5,066,411

SOLID, PLIABLE ORGANIC COMPOUND FOR HOT/COLD THERMAL RESERVOIR

Ruth E. Frye, 505 S. Main St., Lindsay, Okla. 73052

Filed Mar. 26, 1990, Ser. No. 499,624
Int. Cl.[5] C09K *5/00*
U.S. Cl. 252—70 **2 Claims**



1. A thermal reservoir material consisting of propylene glycol compounded with hydroxyethylcellulose in the following proportions:

propylene glycol, 20–40 volume percent of the total composition; and,

the balance, hydroxyethylcellulose.

5,066,412

FRICTION MODIFIER ADDITIVE AND LUBRICATING OIL COMPOSITION CONTAINING SAME

Cyril A. Migdal, Croton-On-Hudson; Shailaja M. Shirodkar, Wappingers Falls, both of N.Y.; Thomas F. DeRosa, Passaic, N.J., and Edward F. Miller, Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 1, 1991, Ser. No. 649,504
Int. Cl.[5] C10M *131/12*
U.S. Cl. 252—54.6 **7 Claims**

1. A lubricating oil composition comprising a major amount

of an oil of lubricating viscosity and a minor amount of a fuel economy additive prepared by the steps comprising:

(a) reacting a perfluoroaliphatic alcohol with a polyalkenyl succinic acid anhydride in the presence of an acid catalyst to form a polyalkenyl succinic mono and/or diester mixture;

(b) heating the mixture to a temperature ranging from about 150° C. to about 180° C. for a period of about 2–4 hours to form the product of an alkenyl succinic mono and/or diester; and

(c) recovering the product polyalkenyl succinic mono and-/or diester.

5,066,413

GELLED, DRYER-ADDED FABRIC-MODIFIER SHEET

George W. Kellett, Cranford, N.J., assignor to Creative Products Resource Associates, Ltd., Clifton, N.J.

Continuation-in-part of Ser. No. 521,242, May 9, 1990, which is a continuation-in-part of Ser. No. 331,870, Apr. 4, 1989, Pat. No. 4,938,879. This application Aug. 17, 1990, Ser. No. 568,836

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] B05D *3/12*; B06M *13/02, 13/17, 13/48*

U.S. Cl. 252—8.75 **7 Claims**

1. A fabric-modifier comprising dimensionally stable gelled sheet consisting essentially of about 15–30% water, about 40–60% of a water-miscible organic solvent selected from the group consisting of a polyethylene glycol, a lower alkanol, a glycol ether, a pyrrolidinone and mixtures thereof, and an amount of a fatty acid salt effective to form a dimensionally gelled stable sheet, having uniformly distributed therein an effective amount of a fabric-modifying agent selected from the group consisting of a quaternary ammonium salt, an imidazolinium salt, a stearyl amine salt, a nonionic surfactant, an amphoteric surfactant and mixtures thereof; wherein said sheet leaves an insignificant residue in a rotary hot air dryer following a laundry drying cycle.

5,066,414

STABLE BIODEGRADABLE FABRIC SOFTENING COMPOSITIONS CONTAINING LINEAR ALKOXYLATED ALCOHOLS

Nienyuan J. Chang, Cincinnati, Ohio, assignor to The Procter & Gamble Co., Cincinnati, Ohio

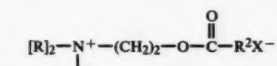
Filed Mar. 6, 1989, Ser. No. 319,936

Int. Cl.[5] D06M *13/165, 13/325*; C11D *1/46, 1/835*

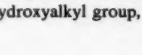
U.S. Cl. 252—8.8 **20 Claims**

1. A liquid fabric softening and antistatic composition, comprising:

(a) from about 1% to about 25% by weight of a quaternized ester-amine softening compound having the formula



and mixture thereof; wherein each R substituent is a C_1–C_6 alkyl or hydroxyalkyl group, or mixtures thereof; R^1 is



or C_{13}–C_{19} hydrocarbyl group; R^2 is a C_{13}–C_{21} hydrocarbyl group; and X^- is a softener compatible anion;

(b) from about 0.1% to about 10% of a linear alkoxylated alcohol selected from the group consisting of the condensation products of C_8–C_{18} linear fatty alcohols with from about 1 to about 10 moles of ethylene oxide or propylene oxide, and mixtures thereof; and

(c) from about 60% to about 98% of a liquid carrier comprising a mixture of water and a C_1–C_4 monohydric alcohol; said softening compound being present as particles which are submicron in size and which are dispersed in said liquid composition with the composition pH being maintained within the range of from about 2.0 to 5.0 and the composition further being maintained substantially free of unprotonated acyclic amines to enhance the hydrolytic stability of said quaternized ester-amine softening compound.

5,066,415

DISHWASHING AGENT

Franz-Josef Dany; Hannsjörg Ulrich, both of Erftstadt, and Lothar Westermann, Cologne, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 572,883

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1989, 3929896

Int. Cl.[5] C11D *7/02*

U.S. Cl. 252—135 **4 Claims**

1. A dishwashing agent based on a crystalline alkali metal layer silicate comprising a crystalline, largely water-insoluble sodium layer silicate having a molar ratio of SiO_2/Na_2O of (1.9 to 3.5):1 and a proton donor selected from the group consisting of mineral acids, polycarboxylic acids, hydroxypolycarboxylic acids, phosphonic acids, acid salts thereof and acid esters thereof, and wherein a 0.5% strength by weight aqueous solution of said dishwashing agent has a pH-value of less than 10.

5,066,416

PROCESS FOR PRODUCING MOLDABLE DETERGENTS HAVING A STABLE AVAILABLE CHLORINE CONCENTRATION

Douglas R. Martin, Orange, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Aug. 31, 1987, Ser. No. 91,181

Int. Cl.[5] B08B *3/04*; C11D *11/00*

U.S. Cl. 252—90 **17 Claims**

1. A process for producing a moldable detergent which comprises:

a) preparing an aqueous slurry containing an alkali metal polyphosphate compound, an alkali metal silicate compound, and an available halogen compound,

b) admixing with the aqueous slurry an alkali metal phosphate compound to produce a moldable detergent composition,

the proportions of the components of steps a) and b) being such that the moldable detergent composition contains at least 50 percent by weight of solids and has an available halogen concentration of at least about 1 percent by weight.

16. A process for producing a solid molded detergent which comprises:

a) preparing an aqueous slurry containing an alkali metal polyphosphate compound, an alkali metal silicate compound, and an available halogen compound,

b) admixing with the aqueous slurry an alkali metal phosphate compound to produce a moldable detergent composition, and

c) pouring the moldable detergent composition into a mold and allowing the composition to harden,

the proportions of the components being such that the molded detergent composition contains at least 50 percent by weight of solids and has an available halogen concentration of at least about 1 percent by weight.

5,066,417

BINARY AZEOTROPIC COMPOSITIONS OF 2,2-DICHLORO-1,2-DIFLUOROETHANE WITH METHANOL, ETHANOL, OR TRANS-1,2-DICHLOROETHYLENE

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 20, 1989, Ser. No. 382,355

Int. Cl.[5] C11D *7/30, 7/50;* C23G *5/028;* B08B *3/00*

U.S. Cl. 252—171 10 Claims

1. An azeotrope consisting essentially of from 85 to 95 weight percent 2,2-dichloro-1,2-difluoroethane and 5 to 15 weight percent methanol wherein said azeotrope boils at about 44.0° C. at atmospheric pressure; 92 to 98 weight percent 2,2-dichloro-1,2-difluoroethane and 2 to 8 weight percent ethanol wherein said azeotrope boils at about 45.8° C. at atmospheric pressure, or 45 to 55 weight percent 2,2-dichloro-1,2-difluoroethane and 45 to 55 weight percent trans-1,2-dichloroethylene wherein said azeotrope boils at about 44.5° C. at atmospheric pressure.

5,066,418

BINARY AZEOTROPIC COMPOSITIONS OF 3-CHLORO-1,1,1-TRIFLUOROPROPANE WITH METHANOL OR ETHANOL, OR TRANS-1,2-DICHLOROETHYLENE

Abid N. Merchant, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 496,915, Mar. 21, 1990. This application Oct. 18, 1990, Ser. No. 599,283

Int. Cl.[5] C11D *7/30, 7/50;* C09K *5/04;* C23G *5/028*

U.S. Cl. 252—172 12 Claims

1. An azeotropic composition consisting essentially of about 55–62 weight percent 3-chloro-1,1,1-trifluoropropane and about 38–45 weight percent trans-1,2-dichloroethylene wherein the composition has a boiling point of about 43.0° C. when the pressure is adjusted to substantially atmospheric pressure.

5,066,419

COATED PERFUME PARTICLES

Darlene R. Walley, Loveland, Ohio; Howard J. Buttery, Newport; Robert J. Norbury, Oakdale, both of Minn.; Diane G. Schmidt, and William R. Michael, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio and Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Feb. 20, 1990, Ser. No. 482,441

Int. Cl.[5] C11D *3/50*

U.S. Cl. 252—174.11 9 Claims

1. A detergent composition, comprising one or more detersive surfactants, optionally, one or more builders, and perfume particles which comprise from about 5% to about 50% by weight of a perfume dispersed in from about 50% to about 95% by weight of a nonpolymeric solid fatty alcohol or fatty ester carrier material, or mixtures thereof, said alcohols or esters having a molecular weight of from about 100 to about 500 and a melting point of from about 37° C. to about 80° C., said alcohols or esters being substantially water-insoluble, said particles having a substantially water-insoluble friable coating on their outer surfaces, said coated particles having an average size less than about 350 microns.

5,066,420

PRODUCTION OF SILICA COLLOIDS

Yvonick Chevallier, Decines, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 754,014, Jul. 11, 1985, abandoned. This application Aug. 5, 1987, Ser. No. 82,988

Claims priority, application France, Jul. 11, 1984, 84 11003

Int. Cl.[5] B01J *13/00;* C01B *33/14*

U.S. Cl. 252—313.2 20 Claims

1. A process for the production of a silica colloid comprising:

(a) forming a reaction medium by simultaneously adding an acidifying agent and an alkaline silicate solution to a reaction vessel;

(b) reacting said acidifying agent and said alkaline silicate solution to form a silica colloid which is substantially monodisperse or substantially polydisperse;

(c) maintaining a constant volume of said reaction medium by drawing off a portion of said reaction medium while additional acidifying agent and alkaline silicate solution in a constant volume are added to said reaction medium, wherein silica is present in said reaction medium in a concentration that avoids agglomeration of colloidal particles; and

(d) accumulating said portion of said reaction medium to form a silica colloid which is substantially polydisperse.

5,066,421

HEATING AND PRODUCING A HYDROCARBON STEAM MIXTURE

Francesco Giacobbe, Rome, Italy, assignor to Mannesmann AG and Kinetics KTI Group BV, both of, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,107

Claims priority, application Italy, Dec. 7, 1987, 48681 A/87

Int. Cl.[5] C01B *3/32*

U.S. Cl. 252—373 12 Claims

1. Method for the continuous production and preheating of a gaseous hydrocarbon and steam blend as a charge for a reforming process for the production of hydrogen or synthesis gas as a reforming product comprising the steps of:

using a single heat exchanger for (i) indirectly preheating the gaseous hydrocarbon, and including (ii) spraying water into a zone of preheating of the gaseous hydrocarbon so that the water evaporates in direct contact with the preheated gaseous hydrocarbon while simultaneously (iii) a blend of the gaseous hydrocarbon and of the steam obtains, and (iv) continuing heating the gaseous hydrocarbon and steam blend; the hydrocarbon water and steam being and remaining physically separated from a heating medium in the heat exchanger; and

extracting the preheated gaseous hydrocarbon and steam from the heat exchanger, to be used as the charge for the reforming process.

5,066,422

STATIC DISSIPATIVE VINYL SURFACE COVERING MATERIALS, METHODS FOR THEM, AND COMPOSITION FOR STATIC DISSIPATION

Richard E. Felter, Lancaster; Dean A. Markley, Mountville, and Deborah L. Musser, Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 201,854, Jun. 3, 1988, now Defensive Publication No. 4,976,890. This application Jun. 8, 1990, Ser. No. 535,054

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] H04B *1/06;* B05D *3/02*

U.S. Cl. 252—511 20 Claims

1. A vinyl surface covering material having reduced electrical surface resistivity, comprising a fused sheet of an overcoated dry blend, wherein the dry blend includes:

(a) a polyvinyl chloride porous dry blend resin, the said

porous dry blend resin comprising particles of resin with a conductive shell,

(b) a plasticizer for the polyvinyl chloride resin,

(c) a stabilizer for the polyvinyl chloride resin, and

(d) conductive particles in an amount of from 0.2 to 20% by weight of the total weight of the material, wherein the conductive particles form the conductive shell, and further, wherein the overcoated dry blend has a vinyl plastisol overcoat.

5,066,423

CONDUCTIVE CERAMIC SINTERED BODY

Yutaka Kubo, Yasugi, and Hisao Hara, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 286,009

Claims priority, application Japan, Dec. 24, 1987, 62-328127; Sep. 22, 1988, 63-238281

Int. Cl.[5] H01B *1/04*; C04B *35/56, 35/58*

U.S. Cl. 252—516 7 Claims

1. A conductive ceramic sintered body consisting essentially of:

a sialon-based ceramic material as a matrix said material represented by the formula $Si_{6-z}Al_zO_zN_{8-z}$, where $z \leqq 0.5$;

15–70 volume %, based on the amount of said matrix material, of a first conductive material which consists of one or more conductive compounds selected from carbides, nitrides, and their composite compounds of transition metals in Groups IVa, Va and VIa of the Periodic Table; and

3–50 volume %, based on the amount of said matrix material, of a second conductive material consisting of SiC; said body having a microstructure comprised of particles of said first and second conductive materials distributed in said matrix, said first conductive material and said second conductive material serving to form paths for electric conduction so that said body has a stable electric resistivity, and said body having high strength, high hardness, and high toughness.

5,066,424

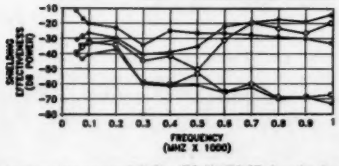
COMPOSITE MATERIAL FOR EMI/EMP HARDENING PROTECTION IN MARINE ENVIRONMENTS

David S. Dixon, Old Lyme, Conn., and James V. Masi, Wilbraham, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1990, Ser. No. 544,297

Int. Cl.[5] H01B *1/20*

U.S. Cl. 252—518 8 Claims



1. A composite material for EMI/EMP hardening protection, comprising:

a preselected 0.01–10 weight percent of non-conducting, non-corrosive matrix material selected from a group of insulating polymers consisting of a PEEK polymer, a polycarbonate polymer and a polycarbonate polymer with an inherently conductive polypyrrole polymer plastic additive;

0–10 weight percent of conducting Nickel-flake particles, embedded in said non-conducting matrix;

5–15 weight percent of non-corrosive semi-conducting oxide particles selected from the group consisting of Indium Tin Oxide, Indium Oxide and Tin Oxide, embedded in said non-conducting matrix and acting in cooperation with said conducting particles in such a way that galvanic potential is lowered;

said preselected weight percent of matrix material comprising the remainder of said composite material.

5,066,425

FORMATION OF HIGH ACTIVE DETERGENT PARTICLES

Kofi Ofosu-Asante, and Scott E. Stephans, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 16, 1990, Ser. No. 552,663

Int. Cl.[5] C11D *1/12, 3/33, 1/72*

U.S. Cl. 252—546 17 Claims

1. A process for producing high active detergent particles, comprising the steps of:

(a) reacting in a continuous high active neutralization loop, the acid form of an anionic surfactant with an alkali metal hydroxide solution, which is about 30 to 75% by weight of the hydroxide and is present in stoichiometric amount to slight stoichiometric excess, to produce a neutralized product;

(b) adding to said continuous high active neutralization loop, during formation of said neutralized product, an α-aminodicarboxylic acid selected from the group consisting of glutamic acid, aspartic acid, aminomalonic acid, aminoadipic acid and 2-amino-2-methyl-pentanedioic acid, or their alkali metal salts; and

(c) forming detergent particles from the molten neutralized product of step (b) by cooling and sequentially or concurrently prilling, extruding, granulating or flaking, said particles comprising from about 50 to 90 weight % of the anionic surfactant and from about 0.2 to 15 weight % of the α-aminodicarboxylic acid salt.

5,066,426

FLUORESCENCE POLARIZATION IMMUNOASSAY UTILIZING SUBSTITUTED CARBOXYFLUORESCEINS

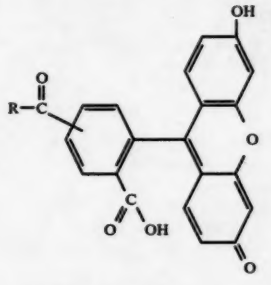
Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laborstories, North Chicago, Ill.

Continuation of Ser. No. 443,401, Nov. 22, 1982, abandoned, which is a division of Ser. No. 329,974, Dec. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 235,259, Feb. 17, 1981, abandoned. This application Aug. 23, 1984, Ser. No. 644,172

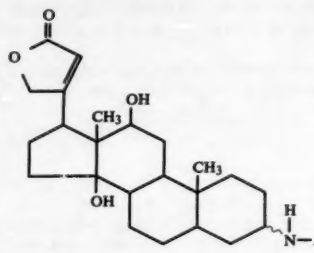
Int. Cl.[5] C07J *21/00, 19/00*

U.S. Cl. 540—106 1 Claim

1. A compound of the formula:



wherein R is a digoxin derivative having the formula:



5,066,427

EICOSATRIYNOIC ACID ESTERS AND THEIR APPLICATION IN PHARMACEUTICAL AND COSMETIC PRACTICE

Braham Shroot, Antibes; Christopher Hensby, Biot; Jean Maignan, Tremblay les Gonesses; Gerard Lang, Saint Gratien; Serge Restle, Aulnay sous Bois, and Michel Colin, Livry Gargan, all of France, assignors to Centre International de Recherches Dermatologiques dite CIRD, Valbonne, France

Division of Ser. No. 881,776, Jul. 3, 1986, Pat. No. 4,877,789.
This application Sep. 22, 1989, Ser. No. 411,043
Claims priority, application France, Jul. 5, 1985, 85 10363
Int. Cl.[5] C11C *1/00*
U.S. Cl. 260—413 12 Claims

1. A compound having the formula

$$C_8H_{17}—(C{\equiv}C—CH_2)_3\ CH_2CH_2COR \qquad (I)$$

wherein

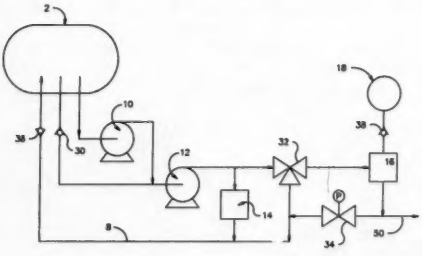
R is a C_1–C_8 lower alkoxy or C_4–C_6 cycloalkoxy group, said alkoxy or said cycloalkoxy group being substituted with one or more hydroxyl groups and/or interrupted by one or more hetero atoms chosen from oxygen and sulfur.

5,066,428

FOAM GENERATING APPARATUS

David Manlowe, and Paul A. Kittle, both of West Chester, Pa., assignors to Rusmar Incorporated, West Chester, Pa.

Filed Aug. 8, 1990, Ser. No. 564,368
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—29 11 Claims



1. A foam generating apparatus, comprising:

a storage tank for storing a foamable liquid;

means for supplying air under pressure;

means for combining air from said supplying means with said foamable liquid to produce a foam product;

pumping means for delivering said foamable liquid from said tank to said combining means;

delivery means, connected to said combining means, for permitting foam to exit said apparatus;

means providing a return path connected to said storage tank;

valve means having a first selectable position for permitting the flow of said foamable liquid from said pumping means to said combining means, and having a second selectable position for preventing the flow of said foamable liquid from said pumping means to said combining means and for permitting the flow of said foamable liquid from said pumping means through said return path to said tank;

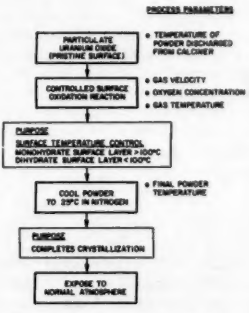
circulation pump means for pumping said foamable liquid from said tank through said pumping means and through said return path while said pumping means is not operating.

5,066,429

METHOD FOR PASSIVATING URANIUM OXIDES TO CONTROL OXIDATION, AND THE OXIDATION RESISTING URANIUM PRODUCT THEREOF

Richard I. Larson, Wilmington; Richard P. Ringle, Scotts Hill, and John L. Harmon, Wilmington, all of N.C., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 232,965, Aug. 17, 1988, abandoned.
This application Oct. 12, 1990, Ser. No. 596,433
Int. Cl.[5] C01G *43/00*
U.S. Cl. 264—0.5 25 Claims



1. A method of passivating the surface portion of loose particles of moisture absorbing oxides of uranium newly produced in a water containing environment with the formation thereof of a protective hydrate surface layer to inhibit oxygen chemisorption of the particle surface, comprising subjecting the loose particles of moisture absorbent oxides of uranium nominally of uranium dioxide to the combination of conditions consisting essentially of:

a. an atmosphere containing oxygen in a concentration of about 0.03 to about 3.0 percent by volume;

b. a temperature within the range of about 40° to about 250° C.; and

c. for a period of at least about 20 minutes up to about 120 minutes whereby the oxygen interacts with the particle surface of the oxides of uranium containing absorbed moisture to produce a protective hydrate surface layer thereon.

5,066,430

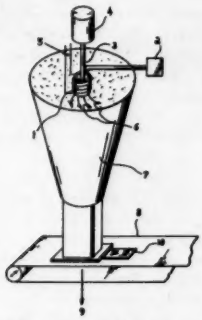
PROCESS FOR CENTRIFUGALLY SPINNING PITCH CARBON FIBERS

Abraham Matthews, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1989, Ser. No. 326,554
Int. Cl.[5] D01D *5/18*
U.S. Cl. 264—8 6 Claims

1. In a process for preparing carbon fibers from mesophase pitch comprising centrifugally spinning a molten mesophase pitch at a temperature of 375° C. to 550° C. over the lip of a

rotor at a centrifugal force of from 200 to 25000 g, the improvement comprising dividing the molten pitch into multiple



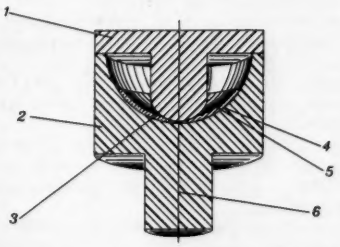
discrete streams within the rotor, the streams being confined in channels which extend to said lip.

5,066,431

METHOD OF MAKING TORIC CONTACT LENSES

Charles R. Briggs, 6815 Academy Parkway West, NE., Albuquerque, N. Mex. 87109, and Charles W. Neefe, 811 Scurry St., Big Spring, Tex. 79720

Filed Apr. 20, 1990, Ser. No. 511,784
Int. Cl.[5] B29D *11/00*
U.S. Cl. 264—2.1 9 Claims



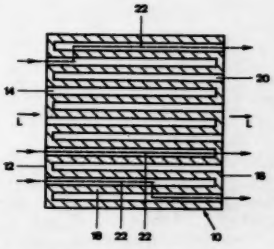
1. A method of making spin cast lenses having a toric central area by the steps of, providing a concave optical mold having a spherical concave optical surface, placing a selected liquid lens monomer in the concave spherical lens mold, placing a convex toric optical mold in the central area of the convex spherical mold thereby displacing the central liquid lens monomer, aligning the optical axis of the concave and convex optical lens molds, the assembled molds are rotated about the common optical axis directed toward the earth's gravitational center forming a spin cast peripheral lens, allowing the liquid lens monomer to polymerize forming a solid lens having a toric central area and a spin cast peripheral, removing the finished lens from the molds.

5,066,432

PROCESS FOR MANUFACTURING A CERAMIC FOAM BODY

Jean-Pierre Gabathuler, Schleitheim; Karl-Ludwig Eckert; Peter Käser, both of Schaffhausen; Albert Maurer, Thayngen, and Anton Fischer, Schaffhausen, all of Switzerland, assignors to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Filed Jul. 18, 1990, Ser. No. 554,277
Claims priority, application Switzerland, Aug. 8, 1989, 2925/89
Int. Cl.[5] B05B *3/00;* B29C *65/00*
U.S. Cl. 264—28 20 Claims



1. Process for manufacturing a Z-flow filter comprising an open pore foam body with a three dimensional ceramic structure, which comprises:

providing a soft open pore plastic foam strip;

impregnating said foamstrip at least once with a ceramic suspension;

freeing said foam strip of excess suspension;

assembling a plastic foam block with a layered structure from said impregnated plastic foam strip by either (a) forming slices from said impregnated strip and stacking at least two of said slices to form layers of impregnated plastic foam including holes therein as flow channels, or (b) coiling said impregnated plastic foam strip to form layers and forming holes as flow channels between at least two of said layers;

heating to a temperature below the melting point of the plastic; and

finally burning off the plastic foam at a temperature at which the ceramic sinters together to form the Z-flow filter with longitudinal channels therein which serve as flow channels.

5,066,433

METHOD OF MANUFACTURING CARBON FIBER USING PRELIMINARY STRETCH

James T. Paul, Jr., New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 156,389, Feb. 16, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,393
Int. Cl.[5] D01F *9/22*
U.S. Cl. 264—29.2 8 Claims

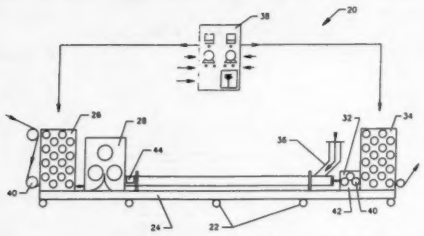
1. In an improved process for manufacturing carbon fiber from polyacrylonitrile precursor comprising

a) subjecting to a spinning operation a viscous solution of an acrylonitrile copolymer of acrylonitrile monomer with at least one ethylenic monomer comprising extruding said solution through a die to form a multitude of continuous filaments and stretching said filaments in cold water, hot water, steam, or a combination thereof to at least twice the original length of the filaments and

b) subjecting said stretched filaments to a carbonization operation comprising oxidizing said stretched filaments of the spinning operation at a temperature range of 180° to 300° C. in an oxidizing atmosphere in a series of ovens and carbonizing the oxidized filaments in progressively increasing temperatures zones at temperatures from 400° to

2800° C. in a series of furnaces so that tar is removed in the first temperature zone, the improvement comprising

i) selecting a precursor being capable of being stretched prior to the carbonization operation at a limited temperature range of from about 140° C. to about 180° C. in air in which range less than 1% based on kinetic calculations of oxidation occurs,



ii) heating said precursor prior to the oxidizing step of the carbonizing operation but after the stretching step of the spinning operation to the limited temperature range of about 140° C. to about 180° C., and

iii) while in said limited temperature range, stretching said precursor again to at least 1.5 times its previously stretched length performed in the spinning operation.

5,066,434

METHOD OF FORMING A MULTILAYER HEAT SEALABLE FILM

Leland L. Liu, Macedon, and Patricia A. Cyr, Farmington, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 208,307, Jun. 16, 1988, Pat. No. 4,944,990. This application Jul. 27, 1990, Ser. No. 559,868

Int. Cl.[5] **B05D** *7/04;* **B29C** *39/20, 47/06;* **B32B** *31/30*

U.S. Cl. 264—37 **6 Claims**

1. A method for producing a multi-layer heat sealable structure comprising:

(a) coextruding a substrate layer of a polyolefin and a second material of higher melting point with a second heat-sealable layer selected from the group consisting of ethylene-propylene random copolymer, ethylene-propylene block copolymer, ethylene-propylene butene-1 terpolymer and blends thereof to form a colayered product;

(b) biaxially orienting the colayered product of step (a) such that said substrate layer becomes white, opaque and cavitated;

(c) treating the colayered product of step (a) to increase surface energy of said second layer;

(d) applying a primer coating on a surface of said second layer having increased surface energy; and

(e) applying a heat sealable layer on said primer coating, said heat sealable layer including a vinylidene chloride copolymer containing at least 50% by weight of vinylidene chloride.

5,066,435

PROCESS AND SYSTEM FOR PRODUCING MULTI-LAYER EXTRUDATE

Hans Lorenz, Darmstadt; Heinz Gross, Rossdorf; Roland Schuchmann, Ober-Ramstadt, and Helmut Häring, Reinheim, all of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Mar. 5, 1990, Ser. No. 488,131

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 8911084[U]

Int. Cl.[5] **B69C** *47/92*

U.S. Cl. 264—40.5 **10 Claims**

1. A system for producing a multi-layer extrudate of thermoplastically processable plastic, comprising:

an extrusion adapted block having a main runner through which an extrudate may flow in a flow direction and at least one secondary runner connected to said main runner and through which another extrudate may flow for merger with the extrudate in said main runner to form a multi-layer extrudate;

means in said adapter block for regulating the thickness of any extrudate flowing through each said at least one secondary runner, comprising a multi-part slide comprising a plurality of side-by-side slide sections mutually spaced in a direction transverse to the flow direction and slidably fitted in said adapter block for movement to adjustably protrude into said secondary runner;

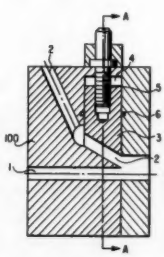
control means for separately controlling movement of at least some of said slide sections, comprising at least two independently movable control elements connected to said slide sections;

a die through which the multi-layer extrudate is extruded said die being wider than said adapter block;

means for selectively measuring the thickness of individual layers of the extruded multi-layer extrudate at a plurality of places distributed over the width thereof; and

means for driving said control elements as a function of the thicknesses measured by said measuring means at width positions assignable by means of trial adjustments to correspond to respective ones of said control elements,

whereby the thicknesses of the layers of the extruded multi-layer extrudate can be controlled during the running operation of the system.



9. A process for producing a multi-layer extrudate of thermoplastically processable plastic, comprising the steps of:

feeding at least two melted thermoformable plastic extrudates to respective runners of an extrusion adapter where said extrudates are merged to form a multi-layer extrudate;

extruding said multi-layer extrudate through a die wider than the extrusion adapted to form an extruded multi-layer extrudate;

sensing a thickness of at least one layer of said extruded multi-layer extrudate at a plurality of positions along the width of said extruded multi-layer extrudate during said extruding step;

providing at least one multi-part slide in said extrusion adapter, said multi-part slide comprising a plurality of side-by-side slide sections mutually spaced along the width of the extrusion adaptor and slidably fitted in the extrusion adaptor for movement to adjustably protrude into a respective one of said runners for adjusting the thickness of the extrudate in said respective one of said runners;

performing trial adjustments of said multi-part slide so as to assign a range of action in the width of the extruded web for each of said slide sections; and

controlling positions of said slide sections during said extruding step as a function of the sensed thickness of said at least one layer at the assigned width positions corresponding to width positions of said slide sections.

5,066,436

PROCESS FOR MICROENCAPSULATION

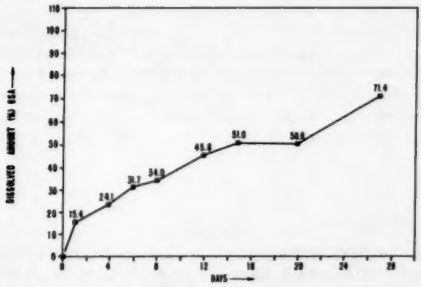
Joseph Komen, Eb Haarlem, and Jan W. Groenendaal, EE Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Dec. 27, 1989, Ser. No. 457,257

Claims priority, application European Pat. Off., Jan. 4, 1989, 89200015.9

Int. Cl.[5] B01T *13/02*

U.S. Cl. 264—4.3 19 Claims



1. A process for microencapsulating bioactive compositions according to the phase separation principle, whereby microcapsules are formed by:

a. dispersing the bioactive composition in an organic solution of a biocompatible polymer;

b. adding a coacervation agent to the dispersion;

c. adding a hardening liquid to the dispersion and

d. collecting, washing and drying the resultant microcapsules, the improvement comprising adding as the hardening liquid an ethyl or isopropyl ester of a straight chain fatty acid having 12–18 carbon atoms to the dispersion in an excess with respect to the combined volume of solvent and coacervation agent.

5,066,437

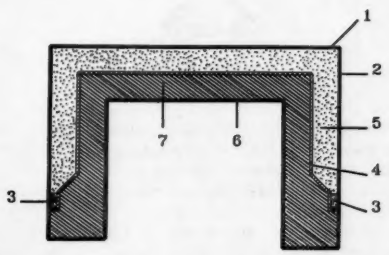
METHOD FOR INSULATING THERMAL DEVICES

Robert W. Barito, and Mary O. Barito, both of 9011 Cardiff Rd., Louisville, Ky. 40242

Filed Mar. 19, 1990, Ser. No. 495,620

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.5 2 Claims



1. A method of insulating thermal devices with a composite insulation system bounded by spaced walls comprising the following steps:

dividing the spaced walls of the thermal device into two sectors,

filling one of the two sectors through a fill port with a powder,

sealing the powder fill port,

filling the other sector with a plastic foamable material,

applying vacuum to the powder filled sector, through an evacuation port, while the plastic foamable material is expanding and curing, and

sealing the evacuation port while maintaining the vacuum.

5,066,438

METHOD OF PRODUCING SILICON NITRIDE SINTERED BODY

Michitaka Sato, and Hiroaki Nishio, both of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Dec. 22, 1989, Ser. No. 455,034

Claims priority, application Japan, Dec. 23, 1988, 63-323618

Int. Cl.[5] C04B *35/58*

U.S. Cl. 264—56 5 Claims

1. A method of producing a silicon nitride sintered body which comprises forming a molded body consisting essentially of an amorphous Si_3N_4 powder which does not contain a sintering aid, which amorphous Si_3N_4 powder has a mean particle size of 5 to 50 nm, a nitrogen content of 30 to 39 wt. %, an oxygen content of 1 to 10 wt. %, the sum of the nitrogen content and the oxygen content being 38 to 42 wt. % and having an unavoidable impurities content of less than 500 ppm as the raw material, sealing the molded body in a capsule and treating it with HIP in the range of 1000° to 1800° C. and 1000 to 2000 atm until the density becomes 3.1 to 3.4 g/cm3.

5,066,439

METHOD OF MAKING POLYESTER FIBERS

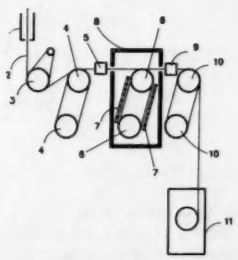
Kinsaku Nishikawa, Uji; Hiroshi Yokoyama, Jyoyo, and Masami Takahashi, Uji, all of Japan, assignors to Unitika Limited, Osaka, Japan

Filed Mar. 27, 1990, Ser. No. 499,863

Claims priority, application Japan, Mar. 27, 1989, 1-75377

Int. Cl.[5] D01D *5/12*

U.S. Cl. 264—103 1 Claim



1. In a continuous spin-draw process of making dimensionally stable polyester fiber having high strength and low shrinkage comprising melt spinning polyethylene terephthalate or a polyester polymer in which polyethylene terephthalate is the main component through a spinning die to produce spun yarn; passing the spun yarn through a heated cylinder installed directly adjacent the face of the spinning die; solidifying the spun yarn by cooling; applying an oil agent; passing the spun yarn to a takeup roller; then continuously drawing the resulting undrawn fiber at a drawing speed of over 2000 meters per minute and then applying a relaxation heat treatment to the drawn yarn; the improvement comprising:

said drawing step comprising multiple drawing stages of at least two stages wherein said spun yarn is passed from the takeup roller to a first pair of drawing rollers, then to a final pair of drawing rollers, then to a pair of relaxation rollers and then to yarn take up means; the surface temperature of said final pair of drawing rollers being maintained at 10° to 60° C. lower than the melting point of the drawn fiber; a non-contact type heated plate whose surface temperature is heated to 250° to 500° C. is positioned 20 to 100 mm separated from the yarn which is wound about the final pair of drawing rollers, thereby heating the yarn to

obtain the relaxation heat treatment between the final pair of drawing rollers and the pair of relaxation rollers; and applying a commingling treatment to the drawn fiber by installing a commingling treatment apparatus between the final pair of drawing rollers and the pair of relaxation rollers.

5,066,440

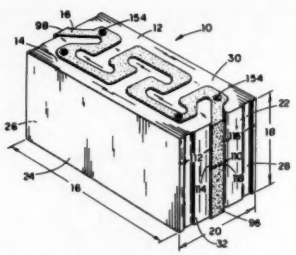
PROCESS FOR MAKING AN INSULATED BUILDING BLOCK

Francis A. Kennedy; John P. Neff, both of Williamsville, and Kenneth J. Blake, East Aurora, all of N.Y., assignors to Thermalock Products, Inc., North Tonawanda, N.Y.

Continuation-in-part of Ser. No. 433,842, Nov. 9, 1989, Pat. No. 4,986,049. This application Oct. 29, 1990, Ser. No. 605,576

Int. Cl.[5] B28B *1/10, 7/00;* **B29C** *43/04;* **B29B** *13/00*

U.S. Cl. 264—69 **15 Claims**



1. A process for preparing a building block, comprising the steps of:

(a) providing a substantially serpentine, integral, insert adapted to form a multiplicity of interlocking projections with curvilinear structure, wherein:

1. said insert is comprised of at least one projection which is curvilinear;

2. said insert consists essentially of material with a density of from about 1.0 to about 2.0 pounds per cubic foot, a flexural strength of from 25 to 125 pounds per square inch, and a shear strength from 25 to 175 pounds per square inch;

(b) providing a substantially rectangular mold;

(c) disposing said insert within said mold;

(d) providing a cementitious material, wherein said material is comprised of at least about 30 weight percent of aggregate, and at least about 5 weight percent of cement;

(e) placing said cementitious material around said insert within said mold;

(f) pressing said cementitious material to form a block until said block has a density of from about 80 to about 150 pounds per cubic foot and until said insert extends beyond the top of said block by from about 0.2 to about 0.6 inches;

(g) removing said block from said mold; and

(h) heating said block for from about 4 to about 10 hours at a temperature of from about 75 to about 250 degrees Fahrenheit.

5,066,441

PROCESS FOR COMPACTING A CALCIUM PHOSPHATE COMPOSITION

Thomas W. Gerard, Upper Saddle River, N.J., assignor to Rhone-Poulenc Basic Chemicals Co., Shelton, Conn.

Continuation of Ser. No. 746,468, Jun. 20, 1985, abandoned, which is a continuation-in-part of Ser. No. 682,570, Dec. 14, 1984, abandoned, which is a continuation of Ser. No. 594,424, Mar. 29, 1984, abandoned, which is a continuation of Ser. No. 444,009, Nov. 23, 1982, abandoned, which is a continuation of Ser. No. 215,953, Dec. 12, 1980, abandoned. This application Jun. 6, 1988, Ser. No. 206,937

Int. Cl.[5] B29B *9/12*

U.S. Cl. 264—118 **10 Claims**

7. A mechanical process for treating fine particles consisting essentially of drymixed calcium phosphate which includes the step of compacting the particles under pressure to form a compacted calcium phosphate followed by the additional step of comminuting said compacted calcium phosphate to granules.

5,066,442

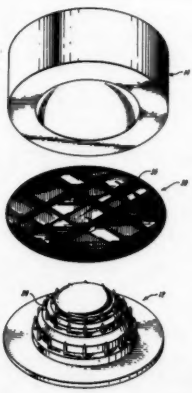
METHOD OF PRODUCING A COMPOSITE ARTICLE

Timothy G. Gutowski, Newton; Michael F. Sentovich, Boston, both of Mass., and Richard K. Okine, Wilmington, Del., assignors to Massachusetts Institute of Technology, Cambridge, Mass. and E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 317,006, Feb. 28, 1989, abandoned. This application Sep. 6, 1990, Ser. No. 580,369

Int. Cl.[5] B29C *43/02*

U.S. Cl. 264—154 **8 Claims**



1. A method of controlling fiber movement during formation of a laminate of fibers in a thermoplastic resin matrix into a desired shaped comprising the steps of:

providing a laminate of fibers in a thermoplastic resin matrix to be formed into a desired shape;

rough forming said laminate into an approximation of said desired shape in a first shaping die having a surface portion, said first shaping die having piercing studs protruding from said surface in a preselected pattern for piercingly engaging said laminate in operation, and making holes therein;

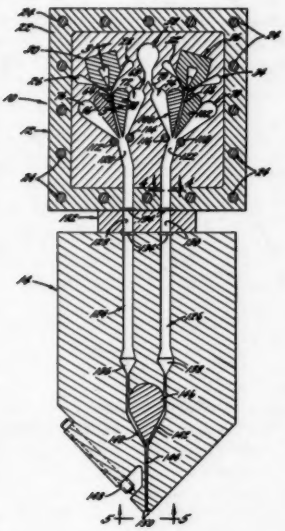
completing the formation of said laminate in a second shaping die in the form of said desired shape, said second shaping die being free of said protruding piercing studs, whereby said holes formed by said piercing studs in said laminate are healed during said forming of said desired shapes.

5,066,443

DUAL BARRIER LAMINATE PROCESS

Peter F. Cloeren, Orange, Tex., assignor to P.C.E. Corp., Orange, Tex.

Filed Apr. 11, 1990, Ser. No. 507,633
Int. Cl.[5] B29C 47/06
U.S. Cl. 264—171 18 Claims



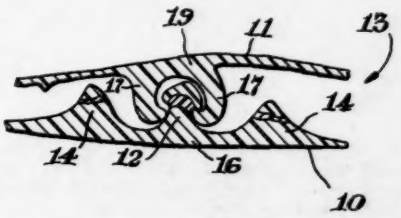
1. A coextrusion process comprising providing a first regrind stream and a second regrind stream; converging a first barrier material stream with said first regrind stream and converging said first barrier material stream with a first skin layer-forming stream to form a first composite stream having said first barrier material stream disposed between a first protective stream comprising said first regrind stream, and a second protective stream comprising said first skin layer-forming stream, said first protective stream and said second protective stream each being of sufficient thickness to overcome interfacial instability of said first barrier material stream during thinning and spreading of said first composite stream, and said first protective stream having a face uncovered by another stream; converging a second barrier material stream with said second regrind stream and converging said second barrier material stream with a second skin layer-forming stream to form a second composite stream having said second barrier material stream disposed between a third protective stream comprising said second regrind stream, and a fourth protective stream comprising said second skin layer-forming stream, said third protective stream and said fourth protective stream each being of sufficient thickness to overcome interfacial instability of said second barrier material stream during thinning and spreading of said second composite stream, and said third protective stream having a face uncovered by another stream; thereafter thinning and spreading said first composite stream and thinning and spreading said second composite stream; and thereafter converging said uncovered face of said first protective stream of said first composite stream with said uncovered face of said third protective stream of said second composite stream to form a third composite stream containing said first and second barrier material streams, having said first and second regrind streams disposed between said first and second barrier material streams, and having said first and second regrind streams separated from said first and second skin layer-forming streams.

5,066,444

PROCESS AND APPARATUS FOR REDUCING COLOR CONTAMINATION IN THE PROCESS RECYCLE OF ZIPPERED THERMOPLASTIC BAGS

R. Douglas Behr, Midland, Mich., assignor to DowBrands Inc., Indianapolis, Ind.

Filed Jul. 5, 1990, Ser. No. 548,524
Int. Cl.[5] B29C 47/04
U.S. Cl. 264—171 16 Claims



1. Apparatus for making a zipper profile having distinct colored and colorless material regimes for a zipper for a reclosable, thermoplastic bag, comprising:

(a) means for providing a continuous flow melt of a colorless thermoplastic material;

(b) means for concurrently providing a continuous flow melt of a colored thermoplastic material;

(c) means for receiving and integrating the colorless and colored flow melts into a continuous combined flow melt having distinct, continuous material regimes wherein the colored flow melt if entirely encapsulated within the colorless flow melt with substantially no intermixing of the colorless flow melt with the colorless flow melt;

(d) means for controllably initiating and terminating the flow of the colored melt to the receiving and integrating means without interrupting the flow of the colorless flow melt comprising a dump valve, the dump valve being adapted to controllably direct the flow melt to or away from the receiving and integrating means; and

(e) die means for receiving and shaping the combined flow melt into the zipper profile

4. A process for making a zipper profile having distinct colored and colorless material regimes for a zipper for a reclosable, thermoplastic bag, comprising:

(a) providing a continuous flow melt of a colorless thermoplastic material;

(b) concurrently providing a continuous flow melt of a colored thermoplastic material while controllably interrupting the flow thereof;

(c) integrating the colorless and colored flow melts into a continuous combined flow melt having distinct, continuous, colored and colorless material regimes without interrupting the flow of the colorless flow melt with colored flow melt being entirely encapsulated within the colorless flow melt with no substantial intermixing of colored flow melt with colorless flow melt; and

(d) passing the combined flow melt through a die to continuously form the zipper profile.

5,066,445

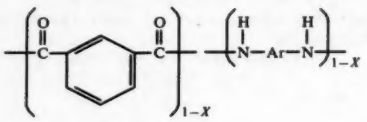
RECOVERY AND MELT EXTRUSION OF AROMATIC/ALIPHATIC COPOLYAMIDES FROM LACTAM-PLASTICIZED POLYMER

Beth E. Dunlap; Fulton F. Rogers, Jr., both of Richmond, Va., and Mark F. Teasley, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

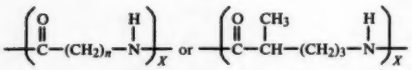
Filed Apr. 12, 1990, Ser. No. 508,862
Int. Cl.[5] B29B 9/12
U.S. Cl. 264—176.1 6 Claims

1. A process for the recovery and melt-extrusion of aromatic/aliphatic copolyamides from lactam-plasticized polymer

comprising dissolving a lactam-plasticized polyamide consisting essentially of the following repeat units:



and



wherein n is 4 or 5; X is from 0.01 to 0.50, preferably 0.02 to 0.30; and Ar is at least one divalent aromatic radical of the group consisting of 1,3-phenylene, 1-methyl-2,4-phenylene, 1-ethyl-2,4-phenylene, 3,4'-oxydiphenylene, 1,3-bis(3-phenyleneoxy) benzene and 1,4-bis(4-phenyleneoxy)-2-phenylbenzene or a mixture of members of said group with minor amounts of 1,4-phenylene of 4,4'-oxydiphenylene radicals, and wherein the lactam is selected from caprolactam, valerolactam and 3-methylvalerolactam, in a solvent of the group consisting of dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide and N,N'-dimethylpropyleneurea; introducing the solution into water with agitation, separating the precipitated polymer from the liquid; melting the polymer and extruding it through an orifice to form a shaped structure substantially free of lactam.

5,066,446

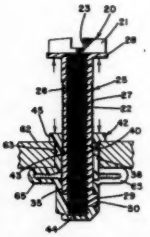
METHOD FOR MAKING A BLIND FASTENER

Ronald W. Phillips, II, Mogadore, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 435,919, Nov. 13, 1989, Pat. No. 4,984,946. This application Aug. 8, 1990, Ser. No. 564,216

Int. Cl.[5] B29C *45/14;* **F16B** *13/06*

U.S. Cl. 264—242 **9 Claims**



1. The method of making a blind fastener consisting essentially of the steps of locating a threaded bolt with a longitudinally extending threaded shank and a flanged head into a first mold that has a cavity therein with such head protruding out of said mold, molding an inner longitudinally extending plastic sleeve with a lower end portion onto said threaded bolt in said first mold wherein the sleeve is interconnected to such bolt by the threads therebetween, said inner sleeve molded in said first mold to have two axially spaced projections that are radially outwardly extending, one of said projections molded in said first mold to the lower end portion of said inner sleeve, and molding an outer sleeve with a lower end portion onto said inner sleeve in a second mold while simultaneously molding at least a pair of axially spaced sockets into said outer sleeve, one of said sockets molded into the lower end portion of said outer sleeve to receive the projection on the lower end portion of said inner sleeve to lock said lower portions together, the other one of said sockets spaced axially from said one socket being an axially extending socket that receives the other one of said projections on said inner sleeve to permit relative movement between said sleeves other that said lower end portions.

5,066,447

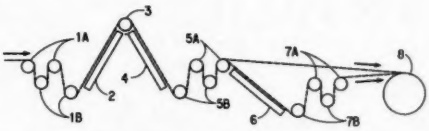
PROCESS FOR IMPROVING THE PROPERTIES OF A FEED YARN

Benjamin H. Knox, West Chester, Pa., and James B. Noe, Wilmington, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 53,309, May 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 824,363, Jan. 30, 1986, abandoned. This application Apr. 14, 1989, Ser. No. 338,251

Int. Cl.[5] D02H *7/00*

U.S. Cl. 264—290.5 **18 Claims**



1. A process for improving the properties of a feed yarn of undrawn polyester filaments, characterized in that said feed yarn is partially drawn by draw-warping to a uniform yarn by hot-drawing or by cold-drawing, with or without heat-setting, said feed yarn being of elongation-to-break (E_B) about 40 to about 120%, tenacity at 7% elongation (T_7) at least about 0.7 grams/denier, boil-off shrinkage (S_1) less than about 10%, thermal stability as shown by an S_2 value less than about +1%, net shrinkage (S_{12}) less than about 8%, maximum shrinkage tension (ST) is less than about 0.3 grams/denier, density (ρ) about 1.35 to about 1.39 grams/cubic centimeter, and crystal size (CS) about 55 to about 90Å and also at least about the following value in relation to the density:

$CS > (250\rho - 282.5)$Å.

5,066,448

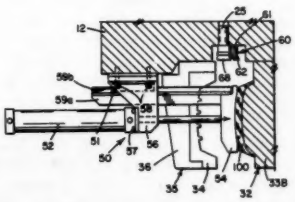
TREAD REMOVAL METHOD AND APPARATUS

Larry E. Chlebina; Norbert Majerus; John S. Rambacher, all of Akron, Ohio, and Stephen L. Felder, Mesquite, Tex., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 3, 1990, Ser. No. 592,164

Int. Cl.[5] B29B *7/10*

U.S. Cl. 264—334 **15 Claims**



1. A method for removing an annular grooved tread from an initially closed segmented mold, the segmented mold having an annular cavity formed by a plurality of mold segments circumferentially surrounding a central core, the mold also having an axial and a radial direction, the method comprising the steps of:

a) radially withdrawing a first plurality of segments:

b) restraining radial movement of the tread at a plurality of locations from which segments have been withdrawn by

engaging the tread at said locations with radially movable tread restrainers

c) radially withdrawing a second plurality of segments;

d) radially retracting the tread restrainers; and

e) removing the tread from the core.

5,066,449

INJECTION MOLDING PROCESS FOR CERAMICS

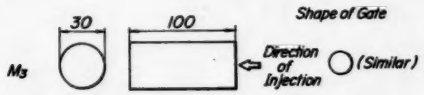
Shigeki Kato, Nagoya, and Katsuhiro Inoue, Ama, both of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Dec. 22, 1989, Ser. No. 454,912

Claims priority, application Japan, Dec. 23, 1988, 63-325574; Dec. 24, 1988, 63-326930; Dec. 24, 1988, 63-326931

Int. Cl.[5] B29B *7/00*; B29C *45/00*

U.S. Cl. 264—406 **11 Claims**



1. An injection molding process for forming flawless ceramic molded bodies, comprising injecting a molding material comprising a ceramic powder and an organic binder into a cavity of a mold of an injection molding machine through a gate having an area of at least 20% a maximum cross-sectional area of said cavity viewed from the gate side thereof such that the molding material flows along the shape of the mold cavity and air is purged smoothly and uniformly from the cavity.

5,066,450

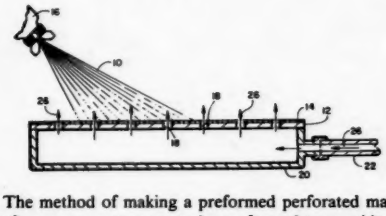
METHOD FOR MAKING PREFORMED MASKANT SHEETS

Arlo M. Steinicke, Victorville, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jul. 28, 1989, Ser. No. 386,306

Int. Cl.[5] B29C *41/08*

U.S. Cl. 264—504 **4 Claims**



1. The method of making a preformed perforated maskant sheet for use on a structure to be perforated to provide a desired surface contour and pattern of perforations therethrough which comprises the steps of:

providing a shaping surface on a sheet having a front and back surface, at least said front surface having the contour of said structure which is to be perforated;

said shaping surface further having a pattern of perforations therethrough corresponding to said desired pattern of perforations in said structure to be perforated;

sealing a plenum to said back surface of said shaping surface sheet, said plenum surrounding said pattern of perforations;

flowing air into said plenum and out through said perforations in said shaping surface;

while flowing said air spraying a coating of liquid maskant material onto said shaping surface;

curing said maskant material to a self supporting perforated sheet state; and

removing said sheet from said shaping surface.

5,066,451

SINGLE-STEP MULTIPLE REPOSITIONINGS OF CONTROL ROD CLUSTER ASSEMBLY DURING EACH NUCLEAR REACTOR FUEL CYCLE

John E. Tessaro, Manor Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1990, Ser. No. 567,465

Int. Cl.[5] G21C *7/08*

U.S. Cl. 376—237 **6 Claims**

1. A method of movably repositioning a control rod cluster assembly of a nuclear reactor relative to a plurality of fuel assemblies in the nuclear reactor within a maximum displacement composed of a multiplicity of separate successive single steps, said method comprising the steps of:

(a) performing a single-step repositioning of a control rod cluster assembly in a nuclear reactor by moving the control rod cluster assembly through soley a single step of such displacement; and

(b) repeating said single-step repositioning at a plurality of separate times during a given fuel cycle of the reactor to perform a sequence of at least more than one of the separate single-step repositionings of the control rod cluster assembly during the given fuel cycle of the nuclear reactor, the separate times being spaced from one another by periods of time during which the control rod cluster assembly remains stationary;

(c) said single-step repositioning being repeated at most once every month during a twelve month fuel cycle.

5,066,452

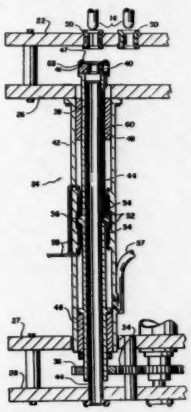
ULTRASONIC PROFILOMETRY SYSTEM FOR CONTROL ROD WEAR

Jimmy W. Hancock; Michael J. Kelly; Wayne M. Latham, and Carlton E. Stinnett, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 24, 1989, Ser. No. 384,358

Int. Cl.[5] G21C *17/00*

U.S. Cl. 376—252 **20 Claims**



1. An apparatus for scanning the outer profile of control rods, comprising:

a module support positioned at a fixed location with respect to a control rod to be scanned, a transducer drive tube mounted for rotation about the axis of a control rod for receiving a control rod therein, a transducer holder connected to the transducer drive tube carrying ultrasonic transducer means facing an interior of said transducer drive tube, for sending an ultrasonic beam to and receiving ultrasonic echo energy from the surface of the control rod, said holder having at least one part for carrying said ultrasonic transducer means which is mounted for limited

radial movement with respect to said transducer drive tube;

rotation means, mounted to said module support and engaged with said transducer drive tube for rotating said transducer drive tube and said ultrasonic transducer means around the axis of the control rod; and

translation means for translating the control rod with respect to said ultrasonic transducer means, in a direction parallel to the axis of the control rod, for scanning the surface of the control rod along a helical path.

5,066,453

NUCLEAR FUEL ASSEMBLY COOLANT CONTROL

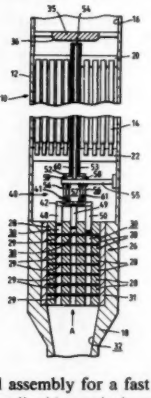
Neil G. Heppenstall, MacClesfield; Colin Betts, Altrincham, and James Ford, West Derby, all of United Kingdom, assignors to The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of The United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 3, 1989, Ser. No. 389,298

Claims priority, application United Kingdom, Aug. 5, 1988, 8818701

Int. Cl.[5] G21C *3/30, 15/06*

U.S. Cl. 376—352 **9 Claims**



1. In a nuclear fuel assembly for a fast nuclear reactor arranged to be cooled by liquid metal, the assembly comprising an elongate metal wrapper, and a plurality of nuclear fuel pins arranged lengthwise therein at a position intermediate the ends of the wrapper, and one of said ends comprising ann inlet for the flow of liquid metal through the wrapper, wherein the improvement comprises a variable flow restrictor for the liquid metal located at the inlet, the variable flow restrictor defining a plurality of ducts for the liquid metal aligned in parallel relationship longitudinally with respect tot he wrapper, means for plugging at least some of the ducts, the plugging means having an array of plugging members locatable in some of the ducts, the plugging members being of different lengths so that longitudinal displacement of the plugging means progressively opens or closes some of the ducts, responsive means disposed lengthwise in the wrapper and responsive to neutron radiation in a manner to cause a predetermined neutron-induced growth of the responsive means, and connecting means for connecting the responsive means to the plugging means so as to effect said longitudinal displacement of the plugging means in response to neutron-induced growth of the responsive means.

5,066,454

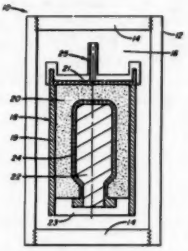
ISOSTATIC PROCESSING WITH SHROUDED MELT-AWAY MANDREL

Andrew D. Hanson, Derry, N.H., assignor to Industrial Materials Technology, Inc., Andover, Mass.

Filed Jun. 20, 1990, Ser. No. 540,683

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—42 **15 Claims**



1. A process for isostatic pressing of compactible material including the steps of enclosing a material charge to be compacted and a melt-away mandrel in a flexible containment bag,

sealing the bag from a fluid environment in a pressurization vessel,

applying pressure via the fluid to the bag to cause hydrostatic compaction of the material against the mandrel, and

applying heat to the compacted material and mandrel until the compacted material and mandrel are separated without fracturing or uncompacting the compacted material, whereby a part having complex form can be made in an isostatic compaction process.

5,066,455

ALLOY STEEL WIRES SUITABLE FOR TIRE CORD APPLICATIONS

Dong K. Kim, Akron, and Robert M. Shemenski, North Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 415,948, Oct. 2, 1989, Pat. No. 4,960,473. This application Jul. 25, 1990, Ser. No. 557,854

Int. Cl.[5] C22C *38/18*

U.S. Cl. 420—100 **8 Claims**

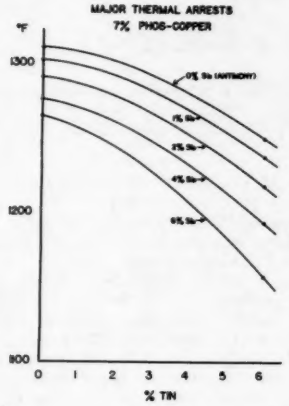
1. A steel alloy composition which is particularly suitable for use in manufacturing reinforcing wire for rubber products which consists essentially of (a) about 95.8 to about 99.3 weight percent iron, (b) about 0.40 to about 1 weight percent carbon, (c) about 0.1 to about 1.2 weight percent manganese, (d) about 0.1 to about 1 weight percent silicon, (e) about 0.05 to about 0.5 weight percent molybdenum and (f) about 0.05 to about 0.5 weight percent cobalt.

5,066,456

PHOSPHOROUS COPPER BASED ALLOY WITH TIN AND ANTIMONY

Richard E. Ballentine, St. Petersburg, Fla., and Joseph W. Harris, Cincinnati, Ohio, assignors to J. W. Harris Co., Inc., Cincinnati, Ohio

Filed Aug. 10, 1990, Ser. No. 566,604
Int. Cl.[5] C22C *9/02*
U.S. Cl. 420—472 3 Claims



1. A phosphorous-copper based alloy comprising by weight:
1.0–6% tin
1.0–6% antimony
7% phosphorous
and the balance copper.

5,066,457

RAPID SOLIDIFICATION ROUTE ALUMINIUM ALLOYS CONTAINING LITHIUM

Howard Jones, Sheffield; Panayiotis Tsakiropoulos, Petersfield, both of England; Charles R. Pratt, Neath, United Kingdom; Robert W. Gardiner, Farnham, England, and James E. Restall, deceased, late of Camberley, England by Janet E. Restall, executrix , assignors to The Secretary of the State for Defence in her Britannic Majesty's Government of United Kingdom, London, England

PCT No. PCT/GB87/00734, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO88/03178, PCT Pub. Date May 5, 1988
PCT Filed Oct. 19, 1987, Ser. No. 346,173
Claims priority, application United Kingdom, Oct. 21, 1986, 8625190
Int. Cl.[5] C22C *21/00, 21/06*
U.S. Cl. 420—552 5 Claims

1. An alloy formed by a rapid solidification rate process consisting essentially of the following ingredients in proportions by weight:

Li 1–5%

one or more of the following refractory elements within the individual proportions stated below and in total proportion not exceeding 5% when present in combination:
Nb 0.2–5.3%
Mo 0.2–5.0%
Hf 0.2–5.0%
Ta 0.2–5.0%
W more than 0.3–5.0 with Al as balance, save for incidental impurities and save for up to 5% in total of one or more of the following conventional strengthening ingredients within the individual proportions stated:
Cu 0–5%
Mg 0–5%
Zn 0–5%.

5,066,458

HEAT RESISTING CONTROLLED THERMAL EXPANSION ALLOY BALANCED FOR HAVING GLOBULAR INTERMETALLIC PHASE

Edward A. Wanner, Leesport, and Sunil Widge, Dryville, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Feb. 22, 1989, Ser. No. 313,753
Int. Cl.[5] C22C *38/52;* B32B *15/04*
U.S. Cl. 420—586 27 Claims

1. A precipitation hardenable, nickel-iron base alloy, said alloy being balanced for precipitating a globular intermetallic phase and having a good combination of elevated temperature strength and ductility, said alloy consisting essentially of, in weight percent, about

	wt. %
Carbon	0.1 max.
Manganese	0.5 max.
Silicon	A small but effective amount up to 0.7
Phosphorus	0.015 max.
Sulfur	0.010 max.
Chromium	0.8 max.
Nickel	32–52
Molybdenum	0.5 max.
Cobalt	0–20
Titanium	1–3
Aluminum	0.2 max.
Niobium	5–7
Vanadium	0.5 max.
Zirconium	0.1 max.
Boron	0–0.02
Copper	0.8 max.
Tungsten	0.5 max.

and the balance is essentially iron, wherein
(a) % Nb$\geqq$6.7−0.5(% Ti) when Ti$\leqq$1.5%;
(b) % Nb$\geqq$18.3−8.2(% Ti) when Ti$\geqq$1.5%;
(c) % Ti$\leqq$0.67(% Nb)−1.3; and
the sum, % Mn×% Cr+% Mo+% V+% Cu+% W$\leqq$2.

5,066,459

ADVANCED HIGH-TEMPERATURE BRAZING ALLOYS

Adrian M. Beltran, Ballston Spa, and Charles H. Kreischer, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 18, 1990, Ser. No. 524,982
Int. Cl.[5] C22C *30/00*
U.S. Cl. 420—58.8 2 Claims

1. A cobalt base, high temperature brazing alloy consisting essentially of, by weight:

Nickel	10%;
Chromium	29%;
Tungsten	7%;
Carbon	0.1%;
Boron	2.5%;
Silicon	2.5%;
Manganese	0.6%;
Hafnium	2%;
Tantalum	2%; and
Cobalt	Balance

5,066,460

CORROSION INHIBITION OF POLYMETHYLPENTENE

Kenneth W. Willcox, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 235,137, Aug. 23, 1988, Pat. No. 4,968,736, which is a division of Ser. No. 161,938, Feb. 29, 1988, Pat. No. 4,793,972. This application Jul. 16, 1990, Ser. No. 553,021

Int. Cl.[5] C08K *5/52;* C09K *15/22;* C08F *110/14;* C23F *11/00*

U.S. Cl. 422—7 21 Claims

1. A process comprising processing a polymer composition wherein said composition comprises:

a) a polymer selected from homopolymers and copolymers of 4-methyl-1-pentene;

b) tris-(3,5-ditert-butyl-4-hydroxybenzyl)isocyanurate; and

c) bis-(2,4-ditert-butyl)pentaerythritol diphosphite;

wherein said composition imparts reduced corrosion to the processing apparatus used in said processing, compared to the corrosion imparted by said polymer without tris-(3,5-ditert-butyl-4-hydroxybenzyl)isocyanurate and bis-(2,4-ditert-butyl)-pentaerythritol diphosphite.

5,066,461

TERPINENE-MALEIC ANHYDRIDE ADDUCT DERIVATIVES AS CORROSION INHIBITORS

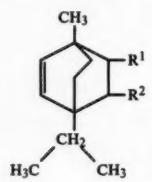
Ewa A. Bardasz, Mentor, Ohio, assignor to Union Camp Corporation, Wayne, N.J.

Filed Jul. 30, 1990, Ser. No. 559,472

Int. Cl.[5] C23F *11/10*

U.S. Cl. 422—16 10 Claims

1. A process for inhibiting corrosion of a metal exposed to oxidative conditions, which comprises; applying to the metal a corrosion inhibiting proportion of a compound selected from those having the formula:



(I)

wherein R^1 and R^2 when taken independently, each represent the monovalent group of formula:

(II)

wherein Y is a monovalent group selected from hydroxyl and a group of the formula:

$$+NH-C_mH_{2m}\frac{}{n}X \quad \text{(III)}$$

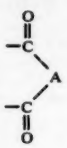
wherein m is from 1 to 6; wherein n is a whole number integer of 0 to 6; X is selected from the group consisting of hydroxyl and amino when n is from 1 to 6; and when n is 0, X is selected from monovalent groups of the formula:

$$-O-C_mH_{2m}-NR^3R^4 \quad \text{(IV)}$$

wherein m is from 1 to 6; wherein R^3 is selected from the group consisting of hydrogen and R^4; and R^4 represents a monovalent group of the formula:

$$-C_mH_{2m}-OH; \quad \text{(V)}$$

wherein m is from 1 to 6; provided that R^1 and R^2 are not both a carboxyl group; and R^1 and R^2 when taken together represent the divalent moiety of formula:



(VI)

wherein A represents one of oxygen and

$$N+C_mH_{2m}-NH\frac{}{n}C_mH_{2m}-NH_2 \quad \text{(VII)}$$

wherein m is from 1 to 6; wherein n has the meaning previously ascribed to it.

5,066,462

ANALYTICAL ELEMENT FOR MEASURING ENZYME ACTIVITY

Kazuya Kawasaki; Mitsutoshi Tanaka; Yoshikazu Amano, and Harumi Katsuyama, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 126,770, Nov. 30, 1987, abandoned. This application Aug. 29, 1989, Ser. No. 401,494

Claims priority, application Japan, Nov. 28, 1986, 61-283628

Int. Cl.[5] G01N *21/01;* C12Q *1/48*

U.S. Cl. 422—56 15 Claims

1. In a dry-type analytical element containing an indicator having color-forming sensitivity for measuring the activity of alanine aminotransferase in a liquid sample, which has one or more water-permeable layers, at least one of the water-permeable layers being a porous spreading layer and at least one of the water-permeable layers containing alanine or its salt and α-ketoglutaric acid or its salt, the improvement comprising that at least one of the water-permeable layers contains a dye which is not the indicator and which has a maximum absorption in the range from 400 to 500 nm in an amount sufficient to prevent an increase in the color-forming sensitivity of the indicator.

5,066,463

MULTIPLE-PURPOSE FECAL EXAMINATION APPARATUS

Maw-Guay Chang, P.O. Box 55-1670, Taipei (10477), Taiwan

Filed Oct. 1, 1990, Ser. No. 591,361

Int. Cl.[5] G01N *21/00*

U.S. Cl. 422—56 3 Claims

1. A multiple-purpose fecal examination apparatus comprising:

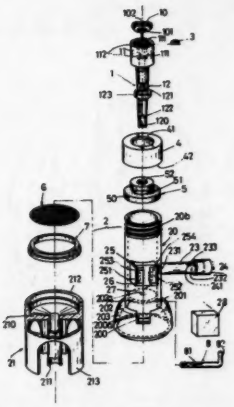
a handle means including a tubular portion having a hollow stem formed on a lower portion of the tubular handle portion and a rake member formed on a bottom portion of said stem, a shallow recess portion formed in a lower portion of said stem approximate to said rake member;

a housing including an upper hollow portion for encasing and supporting said handle means and a lower base portion having a bottom tube adapted for connecting a test tube, said handle means having said hollow stem inserted in a soft packing member sealably mounted on an upper portion of said housing, said lower base portion having a first partition plate separating said upper hollow portion and said lower base portion and having a filter retained on said first partition plate and a slot formed in said upper hollow portion adjacent to said filter for inserting a test paper through said slot for an occult blood test, said upper hollow portion having a second partition plate having a central drain hole formed therein and a valve means formed under said second partition plate for operatively opening said drain hole for draining a fecal solution downwardly into a test tube connected to said bottom tube of said lower base portion for inspecting parasites, said sec-

ond partition plate defining an upper chamber and a lower chamber in said upper hollow portion;

an extension tube laterally protruding from said upper hollow portion above said second partition plate communticated with said upper champer, having a dripping hole formed in an outer portion of said extension tube rotatably closed by a rotating knob rotatably mounted on an outer end portion of said extension tube; and

a platform formed on said upper hollow portion on a side of said extension tube having two windows formed in said platform communicated with said upper chamber, and



two filter papers pre-soaked or pre-impregnated with test reagents thereon overlain on said two windows, and a protective cap shielding said filter papers and said platform;

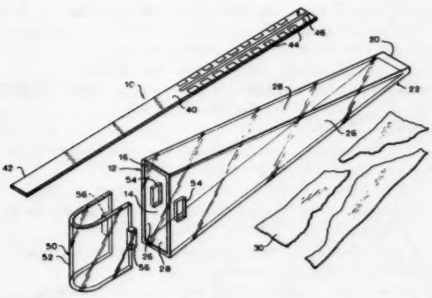
whereby upon a charge of fecal sample into said upper chamber to spread the fecal sample on an inner port of said extension tube or on the two windows of said platform for penetrating fecal samples onto the filter papers, the test reagents may be added through the dripping hole into said extension tube or may be applied on said filter papers for conducting occult blood test of the fecal sample.

5,066,464

PREVACUUM STEAM STERILIZATION TEST PACK

Thomas A. Augurt, New Canaan, Conn., assignor to Propper Manufacturing Company, Inc., Long Island City, N.Y.

Filed Jan. 17, 1990, Ser. No. 466,048
Int. Cl.[5] G01N *25/14*
U.S. Cl. 422—58 **14 Claims**



1. A device adapted for insertion into a sterilization chamber of a prevacuum steam sterilizer for indicating the presence of unacceptable levels of noncondensable gas comprising:

(A) a housing defining a single hollow elongate chamber having an open end, a closed end wherein said open end is larger than said closed end, and wherein said open end and said closed end are disposed opposite one another, said housing further comprising continuously, a sidewall tapering from said open end to said closed end;

(B) a heat sink disposed in said chamber and extending substantially from said open end to said closed end, said heat sink constructed so as to absorb latent heat from steam until the temperature of said heat sink is in equilibrium with ambient sterilizer temperature;

said open end constructed so as to be in flow communication with the sterilization chamber when said device is inserted therein such that when steam enters said heat sink through said open end, said heat sink defines a plurality of tortuous paths through which the steam travels from said open end to said closed end, so as to provide sufficient exposure of the steam to said heat sink so that the steam condenses within said heat sink, releasing any noncondensable gas associated with the steam, forcing the noncondensable gas so released toward and concentrating such noncondensable gas within said closed end; and

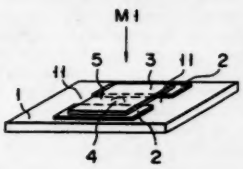
(C) means disposed in said chamber adjacent said closed end for indicating the presence of noncondensable gas concentrated therein.

5,066,465

REACTION APPARATUS

Tokio Kano, Nesconset, N.Y.; Toshinobu Niimura, Hachioji, Japan, and Hiroyuki Yonekawa, St. James, N.Y., assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1989, Ser. No. 457,289
Int. Cl.[5] B01N *21/01*
U.S. Cl. 422—58 **14 Claims**



1. A reaction apparatus for carrying out agglutination reactions, comprising:

a lower plate having an inner wall, said inner wall constructed so as to define at least one recess;

a transparent plate mounted adjacent to said lower plate, said transparent plate comprising a flat surface and communicating with said inner wall of said lower plate;

at least a portion of said inner wall of said lower plate, and said transparent plate, being spaced apart from one another over at least an area of said at least one recess;

means for maintaining said lower plate and said transparent plate positioned relative to each other so as to define a sample inlet channel space between said inner wall of said lower plate and said transparent plate, said sample inlet channel space being in flow communication with said at least one recess and being constructed so as to aspirate a sample into said at least one recess by capillary action, said at least one recess further constructed so as to allow agglutination reactions to form sedimented particle reactions; and

said transparent plate constructed so as to restrict the amount of sample contacting said sample inlet channel space, thereby regulating particle pattern formation within said at least one recess.

5,066,466

APPARATUS FOR INDICATING THE PRESENCE OF TOXIC SUBSTANCES IN AIR THAT IS SUPPLIED TO A PERSONNEL-OCCUPIED SPACE

Heinz Hölter, Beisenstrasse 39-41, 4390 Gladbeck; Heinrich Igelbüscher, Gladbeck; Heinrich Gresch, Dortmund-Wickede; Heribert Dewert, Gladbeck, and Hanns Rump, Unna-Massen, all of Fed. Rep. of Germany, assignors to Heinz Hölter, Gladbeck, Fed. Rep. of Germany

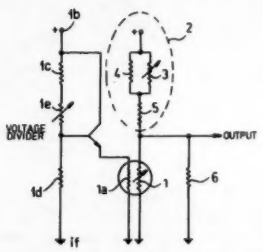
Division of Ser. No. 256,145, Oct. 5, 1988, Pat. No. 4,882,287, which is a continuation of Ser. No. 30,867, Mar. 13, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 440,222

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525774; Apr. 28, 1986, 3614314; May 13, 1986, 3616052; filed as a PCT EP86/00423 Jul. 18, 1986 published as WO87/00634 Jan. 29, 1987

The portion of the term of this patent subsequent to Nov. 2, 2006, has been disclaimed.

Int. Cl.[5] G01N *27/04*

U.S. Cl. 422—98 **2 Claims**



1. An apparatus for indicating the presence of carbon monoxide in an air stream supplied to a personnel-occupied space, comprising:

a resistive sensor constructed so as to detect carbon monoxide and across which an output is tapped;

means for passing at least a portion of said air stream into contact with said sensor whereby said output across said sensor signals the detection of said carbon monoxide;

a resistive heater juxtaposed with said sensor;

a transistor circuit including a transistor connected to said heater and provided with a first voltage divider for controlling a voltage applied to said heater, said first voltage divider being provided with a first temperature-compensating component connected to a voltage source to control the voltage applied to said heater responsive to temperature of said air stream to provide a substantially constant heat output at said heater; and

an external resistance connected in series with said sensor to form a second voltage divider connected to said source and including a second temperature-compensating component, said first and second components being matched so that said first and second voltage dividers compensate each other with respect to a temperature response of the output across said sensor proportional with concentration of said carbon monoxide to be measured to eliminate a temperature effect upon the detection of said carbon monoxide.

5,066,467

LIQUID DEGASSER IN AN EBULLATED BED PROCESS

Ting Y. Chan, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 5, 1990, Ser. No. 593,403

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

Int. Cl.[5] B01J *8/22;* **F27B** *15/02, 15/12*

U.S. Cl. 422—140 **5 Claims**

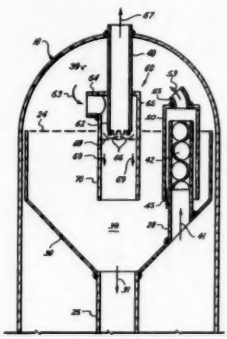
1. A liquid degasser in combination with a high pressure reaction vessel having an upper end and a lower portion,

A. said lower portion adapted for the reaction of a fluid hydrocarbon feed with a hydrogen rich gas at elevated temperatures and pressures in the presence of a bed of solid particulate catalyst, said reaction being the type wherein the gas and hydrocarbon feed are passed upwardly through the bed at velocities whereby the bed is expanded to a volume greater than its static volume and the catalyst is put in a state of random motion and wherein the mixture of hydrocarbon feed, gas and catalyst constitute a catalytic reaction zone wherein minimum catalyst settling takes place, the upper portion of which is defined by a catalyst depleted zone,

B. said reaction vessel upper end having an exit conduit adapted for the removal of products of said reaction,

said liquid degasser comprising:

1. a generally vertical recycle conduit having an enlarged



upper end in fluid communication with a phase separation zone and a lower end in fluid communication with means for recycling liquid from the catalyst depleted zone to the catalytic reaction zone and a plurality of riser conduits adapted for fluid flow therethrough extending through the enlarged upper end, each riser conduit having a lower ends in fluid communication with said catalyst depleted zone and upper ends in fluid communication with first cyclone separators, said first cyclone separators comprising vapor discharge conduits, and

2. a second cyclone separator having a gas outlet conduit in fluid communication with said reaction vessel exit conduit, and an inlet duct in fluid communication with said first cyclone separator discharge conduits.

5,066,468

FOUNTAIN FOR THE RELEASE OF ACTIVE AGENTS INTO WATER DRAWN FROM WELLS

Jean-Claude Arnold, Clamart; Guy Cyprien, L'Hay Les Roses, and Jean-Francois Olivere, Olivet, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 28, 1989, Ser. No. 386,267

Claims priority, application France, Jul. 29, 1988, 88 10537

Int. Cl.[5] B01D *11/02*

U.S. Cl. 422—266 **7 Claims**

1. A fountain for the release of an active agent into water originating from a well, comprising:

a first compartment including an inlet at an upper end thereof for receiving well water and conducting the water downwardly,

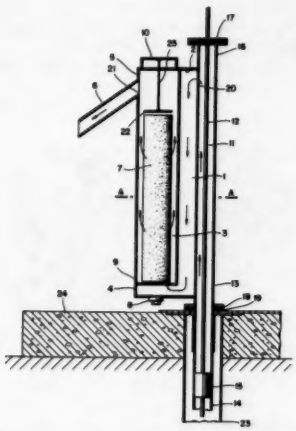
a second compartment including means at a lower end thereof for receiving water from a lower end of said first compartment and conducting the water upwardly,

an outlet arranged at an upper end of said second compartment,

a cartridge arranged in at least one of said first and second compartments for releasing an active agent into water

flowing past said cartridge, both said inlet and outlet being located above an upper end of said cartridge so that said cartridge is kept in water when water is not being circulated through the fountain, and

an additional compartment having an upper end communicating with said upper end of said first compartment and a



lower end adapted to communicate with a well, a movable rod extending vertically through said additional compartment, a piston being carried by said rod and adapted to draw water up to said upper end of said additional compartment and into said upper end of said first compartment.

5,066,469

LEACHING COBALT FROM METAL-CONTAINING PARTICLES

Paul J. Marcantonio, San Rafael, Calif., assignor to Chevron Research and Technology Co., San Francisco, Calif.

Continuation-in-part of Ser. No. 749,614, Jun. 26, 1985, Pat. No. 4,927,794. This application Mar. 9, 1990, Ser. No. 491,048

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] C22B *23/00*

U.S. Cl. 423—150 **13 Claims**

1. A process to extract cobalt from oxidized, metal-containing particles comprising; contacting said oxidized particles with an aqueous solution of ammonia, ammonium salt, and hydrogen peroxide; wherein said aqueous solution has an initial pH of at least 9.5 and an initial hydrogen peroxide concentration of from 0.02 to 0.2 M; and wherein said aqueous solution is maintained at a pH of greater than 9.5.

5,066,470

CYCLIC PROCESS FOR THE REMOVAL OF SULFUR DIOXIDE AND THE RECOVERY OF SULFUR FROM GASES

Ching-Lung Lo, R.D. 1/Box 51, Indian Hill La., Palisades, N.Y. 10964

Filed Jul. 9, 1990, Ser. No. 550,319

Int. Cl.[5] C01G *1/00*; C01B *17/00*; C01F *7/74*

U.S. Cl. 423—242 **21 Claims**

1. A process for the removal of sulfur dioxide from a gas containing sulfur dioxide comprising the steps of: contacting a gas containing sulfur dioxide with an aqueous solution comprising water, ferric chloride and a salt selected from the group consisting of barium chloride and calcium chloride to form ferrous chloride, hydrochloric acid and a precipitate selected from the group consisting of barium sulfate and calcium sulfate; and treating said aqueous solution with an oxidizing agent to convert ferrous chloride to ferric chloride.

5,066,471

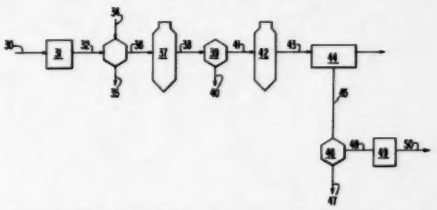
LOWERING POST-PRECIPITATION IN MERCHANT ACID

Dennis H. Michalski, Lakeland, Fla., assignor to IMC Fertilizer, Inc., Northbrook, Ill.

Filed Nov. 26, 1990, Ser. No. 617,634

Int. Cl.[5] C01B *25/222, 25/234*

U.S. Cl. 423—319 **4 Claims**



1. A process for stabilizing solids-containing merchant acid solutions against post-precipitation, said process comprising:

separating an acid stream containing about 45 to about 60 wt % P_2O_5 into a solids-containing bottoms stream and a clarified acid stream;

separating said bottoms stream into a solids-enriched fraction and a merchant acid stream; and

heating said merchant acid stream at atmospheric pressures for about 12 to about 48 hours at a temperature of 180°–200° F. to produce an aged merchant product that exhibits, without further solids separation, an amount of solids formed due to post-precipitation that is less than 1 wt % after 14 days of standing at a temperature of about 70° F.

5,066,472

METHOD FOR PROCESSING THE RESIDUES OF A CHLOROSILANE DISTILLATION

Klaus Ruff, Troisdorf; Bernhard Falk, Rheinfelden-Minseln, and Werner Grätz, Rheinfelden, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 130,806, Dec. 9, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,318

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642285

Int. Cl.[5] C01B *33/107, 33/08*

U.S. Cl. 423—342 **8 Claims**

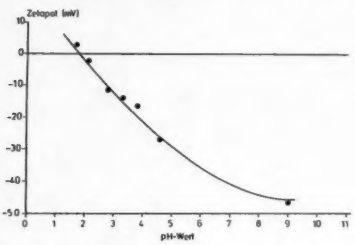
1. A method for processing a chlorosilane containing residue produced as bottom product after the distillation of chlorosilanes from hydrochlorination or chlorination of silicon to recover the chlorosilanes and hydrogen chloride comprising: separating the chlorosilanes contained in the residue; treating the remaining residue with water vapor at a temperature of 100° to 300° C. in the presence of additional hydrogen chloride in amounts of 10 to 40 wt.-% with respect to the hydrogen chloride and water mixture; and recovering hydrogen chloride from a resulting gaseous mixture.

5,066,473

SILICON NITRIDE POWDERS OF LOW ISOELECTRIC POINT AND PROCESSES FOR THEIR PRODUCTION

Ulrike Pitzer; Gerhard Franz, and Benno Laubach, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 396,330, Aug. 21, 1989, abandoned.
This application Sep. 4, 1990, Ser. No. 579,236
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829502
The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.
Int. Cl.[5] C01B *21/068*
U.S. Cl. 423—344 3 Claims



1. Silicon nitride powder having a total oxygen content of less than 1.8% by weight and an isoelectric point in 0.001M aqueous KNO_3 solution of below pH 4.

5,066,474

METHOD FOR SULFUR DIOXIDE PRODUCTION FROM CALCIUM SULFATE BY ENTRAINED HIGH-TEMPERATURE SLAGGING REDUCTION

Douglas H. Laird, San Diego, Calif., assignor to Science Ventures, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 192,338, May 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 8,763, Jan. 30, 1987, abandoned. This application Dec. 13, 1989, Ser. No. 450,028
Int. Cl.[5] C01B *17/50*
U.S. Cl. 423—541 R 21 Claims

1. A method for producing sulfur dioxide from calcium sulfate-bearing reactants comprising:

combining in a fired reaction vessel an oxygen-bearing gas, fuel, and finely divided solid particles of a calcium sulfate-bearing reactant and of a mineral fluxing agent to form a mixture, the respective amounts of fuel and oxygen in said mixture being sufficient to support continuing combustion in said reaction vessel while maintaining a reducing atmosphere sufficient to desulfurize said calcium sulfate to sulfur dioxide; and to maintain a temperature in said reaction vessel sufficiently high to form and maintain liquid slag in said reaction vessel but lower than that causing formation of substantial amounts of dust containing oxides of silicon that remains suspended in exit gas stream;

draining from a bottom region of said reaction vessel said liquid slag; and

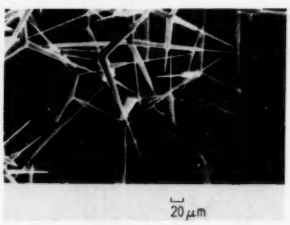
removing from said reaction vessel a sulfur dioxide containing gas.

5,066,475

ZINC OXIDE WHISKERS HAVING A NOVEL CRYSTALLINE FORM AND METHOD FOR MAKING SAME

Minoru Yoshinaka; Eizo Asakura, both of Osaka; Toshihiro Misaki, Takarazuka; Motoi Kitano, Kawanishi, and Hideyuki Yoshida, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 29, 1988, Ser. No. 291,611
Claims priority, application Japan, Dec. 29, 1987, 62-334418; Feb. 24, 1988, 63-41329; Feb. 24, 1988, 63-41330
The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.
Int. Cl.[5] C01G *9/02*
U.S. Cl. 423—622 63 Claims



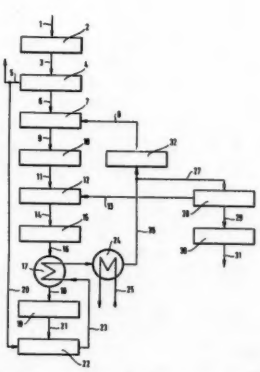
1. A method for preparing whiskers of zinc oxide which comprises providing a metallic zinc powder having an oxide film on the surfaces thereof, and thermally treating said metallic zinc powder in an atmosphere containing molecular oxygen under thermal treatment conditions sufficient to form a product comprising whiskers of zinc oxide having a crystal form including a central body and four needle crystal projections extending from the central body.

5,066,476

METHOD OF PRODUCING HYDROGEN-RICH GAS

Rolf Wetzel, Heiligenhaus, and Bernhard Firnhaber, Essen, both of Fed. Rep. of Germany, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 550,105
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925564
Int. Cl.[5] C01B *3/02*
U.S. Cl. 423—648.1 13 Claims



1. A method of producing a hydrogen-rich gas with a hydrogen content of at least 85 volume percent by gasifying of finely grained to pulverulent fuels at temperatures above a slag melting point, comprising the steps of gasifying a finely grained to pulverulent fuel in a gasifier to produce a partial oxidation crude gas; indirectly cooling the partial oxidation crude gas in

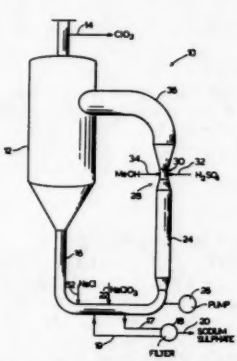
a waste heat boiler arranged after the gasifier; cooling again the partial oxidation crude gas after the waste heat boiler by adding converted circulating gas to the gas mixture; subjecting the produced gas mixture to a dry de-dusting; saturating the dedusted gas mixture with the use of a condensate produced during cooling of a product gas partial stream and washing at dew point of the gas mixture; subjecting the purified gas mixture after heating to a CO-conversion in the presence of a sulfur resistant catalyst in a conversion reactor; cooling a CO-poor gas leaving the conversion reactor to approximately its water vapor dew point and then subdividing in a circulating gas partial stream and a product gas partial stream; supplying the circulating gas partial stream after a compression as the converted circulating gas to the partial oxidation crude gas after the waste heat boiler for cooling the partial oxidation crude gas; and subjecting the product gas partial stream to a cooling for water vapor condensation, a de-sulfurization, a CO_2 removal, and a further gas treatment for a further utilization.

5,066,477

PRODUCTION OF CHLORINE DIOXIDE

Michael S. Zell, and Maurice C. J. Fredette, both of Mississauga, Canada, assignors to Tenneco Canada Inc., Islington, Canada

Continuation of Ser. No. 230,962, Aug. 11, 1988, abandoned.
This application Sep. 18, 1990, Ser. No. 584,494
Int. Cl.[5] C01B *11/02*
U.S. Cl. 423—479 26 Claims



1. A process for preparing chlorine dioxide, which comprises :

feeding into a first elongate zone an aqueous sodium chlorate-containing stream having an elevated temperature which is about its boiling pint at a subatmospheric pressure applied to the downstream end of said first zone,

diverting a portion of the aqueous sodium chlorate-containing stream into a second elongate zone located within said first elongate zone,

feeding methanol and sulphuric acid only into said second elongate zone to form a chlorine dioxide-generating reaction medium in said second elongate zone having an acidity greater than that of said sodium chlorate-containing stream in said first elongate zone,

generating chlorine dioxide from said chlorine dioxide-generating reaction medium in said second elongate zone,

discharging chlorine dioxide and spent reaction medium from said second elongate zone and an aqueous sodium chlorate-containing stream from said first elongate zone into an evaporating and crystallizing zone wherein by-product crystalline sodium sulphate is formed, and

recovering a gaseous admixture of chlorine dioxide and steam from said evaporating and crystallizing zone and removing crystalline sodium sulphate from said evaporating and crystallizing zone.

5,066,478

RADIO LABELED ORGANIC AMINE PHOSPHONIC ACID COMPLEXES FOR THE TREATMENT OF CALCIFIC TUMORS

Jaime Simon, Angleton; David A. Wilson, Richwood, both of Tex.; Wynn A. Volkert; David E. Troutner, both of Columbia, Mo., and William F. Goeckeler, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 50,263, May 14, 1987, Pat. No. 4,898,724.
This application Jan. 30, 1990, Ser. No. 472,506
Int. Cl.[5] A61K *43/00*
U.S. Cl. 424—1.1 87 Claims

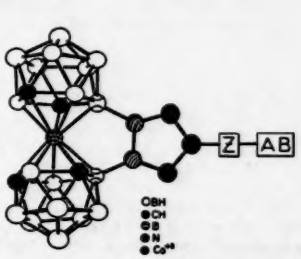
1. A therapeutically effective composition comprising an aminophosphonic acid which is ethylenediaminetetramethylenephosphonic acid or a physiologically acceptable salt thereof and at least one radionuclide selected from Gd-159, Ho-166, Lu-177 and Yb-175.

5,066,479

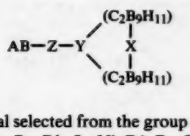
METALLACARBORANE CHELATES

M. Frederick Hawthorne, Los Angeles, Calif., assignor to The Regents of the Univ. of California, Berkeley, Calif.

Filed May 31, 1988, Ser. No. 200,750
Int. Cl.[5] A61K *49/02, 39/44;* C07K *17/06*
U.S. Cl. 424—1.1 11 Claims



1. A metallocarborane chelate-antibody compound having a formula



wherein X is a metal selected from the group consisting of Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag and Au, Y is a rotation resistant organic chelate bridge moiety, Z is an antibody linkage moiety and AB is an antibody.

5,066,480

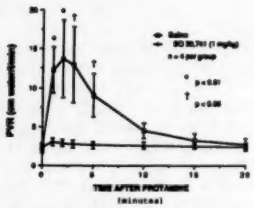
METHOD OF PREVENTING OR REDUCING ADVERSE REACTIONS TO PROTAMINE USING A THROMBOXANE A_2 RECEPTOR ANTAGONIST

Martin L. Ogletree; William A. Schumacher, both of Newtown, Pa.; Gary J. Grover, Stockton, N.J., and Lawrence T. Friedhoff, Philadelphia, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 11, 1988, Ser. No. 179,694
Int. Cl.[5] A61K *49/00*
U.S. Cl. 424—10 20 Claims

1. A method for treating pulmonary hypertension caused by protamine induced neutralization of heparin, in a mammalian

species, which comprises administering to a mammalian species in need of such treatment an effective amount of a thromboxane A_2 receptor antagonist which acts only on thromboxane A_2 receptors.



5,066,481

MOUSSE HAIR COMPOSITION

Michael W. Helioff, Westfield; Krystyna Plochocka, Scotch Plains, and Mohammed Tazi, Wayne, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Nov. 5, 1990, Ser. No. 608,949
Int. Cl.[5] A61K *7/11*
U.S. Cl. 424—47 **6 Claims**

1. A mousse hair composition for aerosol use consisting essentially of a resin provided by about 3–15% by weight of about a 20–50% resin active alcoholic solution of the monoester of a C_1–c_5 alkyl vinyl ether-maleic anhydride copolymer having a molecular weight of at least about one million, which is about 5–90% neutralized, about 60–95% by weight of water, about 0.3–2.0% of surfactant and about 0—30% of added ethanol.

5,066,482

COMPOSITIONS AND METHOD FOR CONTROLLING COCKROACHES

Gustave K. Kohn, Los Altos, Calif.; Robin R. Rudolph, Grand Prairie, Tex.; Gerardus B. Staal, Palo Alto; David L. Grant, Menlo Park, both of Calif.; Robert C. Pearce, Arlington, and Barbara A. Herbst, Flower Mound, both of Tex., assignors to Sandoz Ltd., Switzerland

Continuation of Ser. No. 300,152, Jan. 19, 1989, abandoned, which is a continuation of Ser. No. 167,079, Mar. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 928,071, Nov. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 733,444, Jul. 29, 1985, abandoned. This application May 4, 1990, Ser. No. 518,274
Int. Cl.[5] A01N *37/06*; A61L *9/04*
U.S. Cl. 424—45 **10 Claims**

1. A method of controlling a cockroach population comprising administering to a cockroach population or its infested habitat a cockroach reproduction inhibiting amount of hydroprene comprising at least 90% of its S-(+) enantiomer.

5,066,483

ORAL RINSE COMPOSITIONS

Ronald J. Harkrader; Richard R. Jones, and Kenneth S. Peterson, all of Fort Collins, Colo., assignors to Vipont Pharmaceutical, Inc., Fort Collins, Colo.

Division of Ser. No. 322,659, Mar. 13, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 583,835
Int. Cl.[5] A61K *7/22, 35/78*
U.S. Cl. 424—54 **10 Claims**

1. A stable oral rinse composition comprising from about 0.01 to 0.2% by weight of benzophenanthridine alkaloid in an aqueous solution and a buffer system in a quantity sufficient to adjust the pH of said composition to a pH in the range of 4.0 to 5.6.

5,066,484

NAIL ENAMELS CONTAINING GLYCERYL, GLYCOL OR CITRATE ESTERS

Anthony Castrogiovanni, Belford; Robert W. Sandewicz, Spotswood, and Steven W. Amato, Fanwood, all of N.J., assignors to Revlon, Inc., New York, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,495
Int. Cl.[5] A61K *7/043*
U.S. Cl. 424—61 **8 Claims**

1. A nail enamel comprising a film forming component, a solvent component, and a plasticizer component, wherein the plasticizer component comprises a compound of the formula:

(I)

wherein R_1, R_2, and R_3 are BZ wherein BZ is a phenyl ring which is unsubstituted; or substituted with one or two groups of the formula —C(O)OR_5 wherein R_5 is phenyl, straight or branched alkyl containing 1 to 35 carbon atoms, or straight or branched alkenyl containing 2 to 35 carbon atoms, the alkyl and alkenyl optionally substituted with —CN, —SCN, —NO_2, —OH, —SH, —NH_2 or —$CONH_2$; or substituted with one, two or three substituents selected from the group consisting of

—CN, —SCN, —Cl, —Br, —F, —OCH_3, —OC_2H_5,

—OC_6H_5, —$CH{=}CH_2$, C_{1-6}alkyl, —$CH_2CH{=}CH_2$,

—NO_2, —NH_2, —OH, —SH, and —SO_2NH_2;

and wherein d is 1 to 1,000;

each y is ethoxy, isopropoxy, or propoxy;

R_4 is H— or (Alk)—C(O)— wherein (Alk) is straight or branched alkyl containing 1 to 5 carbon atoms; and

R_6 is a straight or branched alkyl containing 1 to 18 carbon atoms or straight or branched alkenyl containing 2 to 18 carbon atoms.

5,066,485

COSMETIC COMPOSITIONS COMPRISING OIL-IN-WATER EMULSION CONTAINING PIGMENT

Hernando Brieva, Manalapan, N.J.; Natividad Jose, Jamaica, and Marlene Tietjen, New York, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

Continuation of Ser. No. 453,363, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 259,464, Oct. 17, 1988, abandoned, which is a continuation of Ser. No. 11,971, Feb. 6, 1987, abandoned. This application Sep. 5, 1990, Ser. No. 579,180
Int. Cl.[5] A61K *7/021*
U.S. Cl. 424—63 **8 Claims**

1. A cosmetic composition which is an oil-in-water emulsion comprising:

(a) About 10 to about 60 wt. % of the total weight of the composition of an oil phase which comprises

(i) About 5 to about 30 wt. % of the emulsion of a coated pigment consisting essentially of finely divided particles of pigment whose surfaces are chemically bonded to, and physically completely coated by, polysiloxane which coating renders the particles hydrophobic, and

(ii) a silicone component selected from the group consisting of dimethyl polysiloxane having the formula $(CH_3)_3SiO(Si(CH_3)_2O)_1{—}Si(CH_3)_3$ wherein the degree of polymerization d is effective to give the fluid a viscosity of 0.65 to one million centistokes at 25° C.; cyclomethicone having a degree of polymerization of 3 to 6; organopolysiloxane having the formula

$X(CH_3)_2SiO{—}Y{—}Si(CH_3)_2X$

wherein X is alkyl or alkoxy having 1 to 30 carbon atoms and Y is a chain of 1 to 100 repeating (Si—O) units containing 1 to 100 units of the formula (—$Si(R_3)(R_4)O$) wherein each of R^1, R^2, R^3 and R^4 can be alkyl containing 2 to 30 carbon atoms, phenyl, or phenyl connected to the Si atom by a vinyl group or an alkylene bridge 1 to 3 carbon atoms long; wherein each R_1 and R_3 can also be —CH_3, and each R_1 and R_2 can also be trimethylsiloxy; and mixtures thereof;

(b) About 25 to about 60 wt. % of the total weight of the composition of an aqueous phase which comprises:

(c) About 0.5 to about 10 wt. % of a surfactant component which comprises one or more polydiorganosiloxane-polyoxyalkylene copolymers containing at least one polydiorganosiloxane segment consisting of

$$R_bSiO_{(4-b)/2}$$

siloxane units wherein b has a value of from 0 to 3 inclusive, there being an average of approximately two R radicals per silicon in the copolymer, and R denotes a radical selected from the group consisting of methyl, ethyl, vinyl, phenyl and a divalent radical bonding a polyoxyalkylene segment to the polydiorganosiloxane segment, at least 95 percent of all R radicals being methyl; and containing at least one polyoxyalkylene segment having an average molecular weight of less than 5000 and consisting of from 0 to 50 mol percent polyoxyalkylene units and from 50 to 100 mol percent polyoxyethylene units, at least one terminal portion of said polyoxyalkylene segment being bonded to said polydiorganosiloxane segment, any terminal portion of said polyoxyalkylene segment not bonded to said polydiorganosiloxane segment being satisfied by a terminating radical; and

wherein said surfactant component is present in an amount effective to form a stable emulsion of said oil phase in said water phase.

5,066,486

METHOD FOR PREPARING COSMETIC PRODUCTS AND THE PRODUCTS OBTAINED THEREBY

Melvin E. Kamen, Highlands, and Philip Bernstein, Glen Ridge, both of N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 258,219, Oct. 14, 1988, Pat. No. 4,938,952. This application Mar. 22, 1990, Ser. No. 497,277

Int. Cl.[5] A61K *7/021, 7/027, 7/032*

U.S. Cl. 424—63 **34 Claims**

10. An improved cosmetic product which is a lipstick or pencil prepared by:

a) admixing 1–25% of a binding agent consisting of a fibrillated polymer and about 75–99% of a cosmetic composition comprising at least one wax and one hydrocarbon oil;

b) forming the resultant admixture of said fibrillated polymeric binding agent and said cosmetic composition into a cosmetic lipstick or pencil.

5,066,487

ANTISUDORAL COMPOSITION COMPRISING DIBASIC ALUMINIUM SALTS OF ACYLATED AMINO ACIDS

Jean V. Morelle, and Eliane Lauzanne-Morelle, both of Paris, France, assignors to Rhone-Poulenc Chimie, France

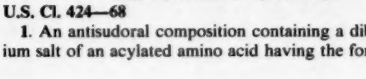
Filed Sep. 12, 1989, Ser. No. 406,435

Claims priority, application France, Sep. 14, 1988, 88 11983

Int. Cl.[5] A61K *7/38;* **C07F** *5/06*

U.S. Cl. 424—68 **19 Claims**

1. An antisudoral composition containing a dibasic aluminium salt of an acylated amino acid having the formula



wherein R represents a hydrocarbon chain having from 5 to 10 carbon atoms and R′ represents the main chain of the illustrated α-amino acid or a mixture of such salts, together with a diluent or carrier.

5,066,488

SEMI-ANHYDROUS, SUSPENSION PROCESS FOR PREPARING UNIFORM, FREE-FLOWING, FINE, WHITE POWDERS OF SUBSTANTIALLY ANHYDROUS COMPLEXES OF PVP AND H_2O_2 CONTAINING ABOUT 18 TO ABOUT 22% H_2O_2

John J. Merianos, Middletown; Robert B. Login, Oakland, and Paul Garelick, South Plainfield, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Division of Ser. No. 278,342, Dec. 1, 1988, Pat. No. 4,948,823. This application Jun. 6, 1990, Ser. No. 533,749

Int. Cl.[5] A61K *31/785*

U.S. Cl. 424—80 **6 Claims**

1. A suspension process for preparing uniform, free-flowing, fine, white powders of a complex of PVP and H_2O_2 having an H_2O_2 content between about 18 and about 22% H_2O_2 and about 2% water or less which comprises:

(a) forming a suspension of water-insolubie PVP containing less than about 1% water in anhydrous ethyl acetate;

(b) slowly adding an aqueous H_2O_2 solution containing about 70 to about 85% by weight H_2O_2, the amounts of PVP and H_2O_2 corresponding substantially to the desired molar ratio of PVP and H_2O_2 in the complex, at a temperature of about 0°–10° C., under agitation, to precipitate a PVP-H_2O_2 complex in the form of a uniform, free-flowing, fine, white powder,

(c) filtering, and

(d) drying the web precipitate with substantially no loss of H_2O_2 to form the desired powders having the improved properties defined above.

5,066,489

COMBINATION THERAPY OF IL-2 AND DTIC FOR THE TREATMENT OF MELANOMA

Carolyn M. Paradise, Emeryville, and Edward C. Bradley, Moraga, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 174,000, Mar. 28, 1988, Pat. No. 4,999,339. This application Jul. 24, 1990, Ser. No. 557,203

Int. Cl.[5] A61K *37/02*

U.S. Cl. 424—85.2 **33 Claims**

1. A method for the therapeutic treatment of melanoma in a human patient having said disease comprising parenterally administering to said patient a synergistic combination of IL-2 and DTIC effective to cause regression of the melanoma.

5,066,490

PROTEIN CROSSLINKING REAGENTS CLEAVABLE WITHIN ACIDIFIED INTRACELLULAR VESICLES

David M. Neville, Jr., Bethesda, and Kasturi Srinivasachar, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

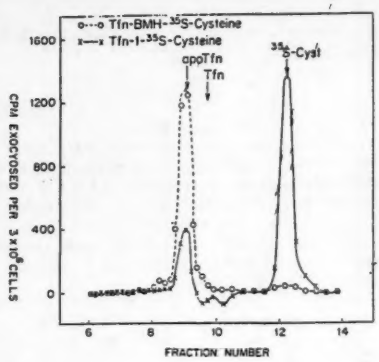
Filed Jun. 1, 1988, Ser. No. 204,163

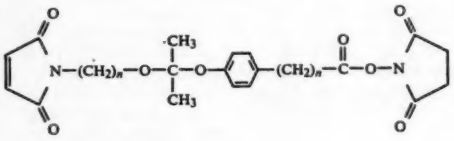
Int. Cl.[5] A61K *39/44, 37/48;* **C07K** *17/02*

U.S. Cl. 424—85.91 **21 Claims**

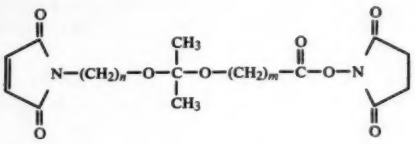
15. A pharmaceutical composition comprising:

a conjugate of a biologically active component crosslinked with a crosslinker to a targeting moiety comprising a binding partner to cell surface features wherein the crosslinker can be cleaved under mild acidic conditions and wherein the crosslinker is formed from a compound selected from the group consisting of compounds of the following formulas:

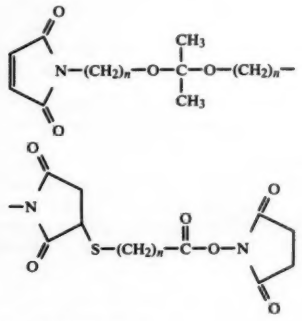




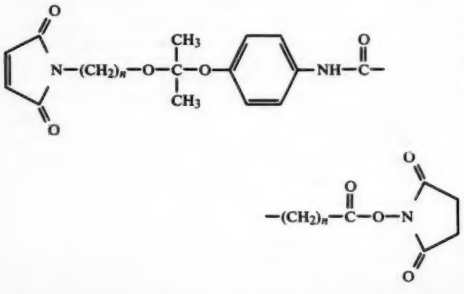
wherein n is at least 1;



wherein n is at least 1 and m is at least 1;



wherein n is at least 1;



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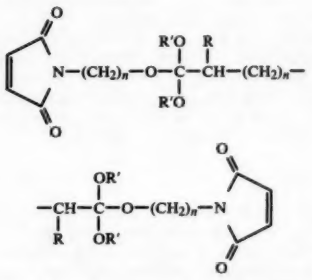
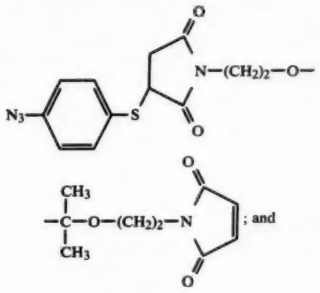
wherein n is at least 1;

wherein n is at least 1;



wherein n is at least 1, R′ is selected from the group consisting of C_1 to C_8 alkyl groups and R is selected from the group consisting of H and C_1 to C_8 alkyl groups;



a pharmaceutically acceptable carrier.

5,066,491

METHOD OF DISEASE TREATMENT UTILIZING AN IMMUNOLOGICALLY ACTIVE WHEY FRACTION

Gerald H. Stott, Emmett, Id., and David O. Lucas, Plymouth, Minn., assignors to Protein Technology, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 946,435, Dec. 29, 1986, Pat. No. 4,834,974, which is a continuation-in-part of Ser. No. 818,610, Jan. 13, 1986, Pat. No. 4,816,252, which is a continuation-in-part of Ser. No. 723,612, Apr. 15, 1985, abandoned. This application Feb. 3, 1989, Ser. No. 306,817

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] A61K *39/395*

U.S. Cl. 424—85.8 **24 Claims**

1. A method of disease treatment utilizing a therapeutically effective product produced from whey having 1) a bottom fraction including lactose and minerals; 2) a middle fraction including lower molecular weight proteins; and 3) a top fraction including higher molecular weight proteins, comprising the steps of:

a. providing whey derived from ordinary milk, said whey including in the top fraction a measurable but low level concentration of immunologically active immunoglobulin including various different pathogen specific antibodies;

b. ultrafiltering said whey to reduce the bottom fraction concentration and to increase the relative middle and top fraction concentrations under conditions which substan-

tially preserve the immunological activity of the immunoglobulin to yield a primary product;

c. ultrafiltering the primary product to reduce the middle fraction concentration and to increase the top fraction concentration under conditions which substantially preserve the immunological activity of the immunoglobulin in the primary product to yield a secondary product having a concentration of immunologically active immunoglobulin of at least about seven percent of total solids;

d. removing water from the secondary product under conditions which substantially preserve the immunological activity of the immunoglobulin in the secondary product;

e. periodically testing the secondary product to verify its activity to a specified microbe; and

f. orally administering a therapeutically effective dose of the secondary product to an animal to treat a predetermined disease.

5,066,492

METHOD OF TREATING HERPES SIMPLEX VIRUS

Gordon R. B. Skinner, Solihull, and Alexander Buchan, Birmingham, both of England, assignors to University of Birmingham, England

Continuation of Ser. No. 21,491, Mar. 4, 1987, abandoned. This application May 25, 1990, Ser. No. 528,344

Claims priority, application United Kingdom, Mar. 5, 1986, 8605390

Int. Cl.[5] A61K *39/12*; **C12N** *7/00*

U.S. Cl. 424—89 **3 Claims**

1. A method of preventing or treating herpes simplex infection of a human subject comprising inoculation of said subject with bovine mammillitis virus.

5,066,493

RAPAMYCIN IN TREATMENT OF TUMORS

Surendra N. Sehgal, Princeton, N.J., and Claude Vezina, Oka, Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 391,334, Aug. 9, 1989, abandoned, which is a division of Ser. No. 592,193, Mar. 22, 1984, Pat. No. 4,885,171, which is a continuation of Ser. No. 126,276, Mar. 3, 1980, abandoned, which is a continuation of Ser. No. 957,626, Nov. 3, 1978, abandoned. This application Apr. 9, 1991, Ser. No. 682,813

Int. Cl.[5] H61K *31/66, 31/505, 31/415, 35/74*

U.S. Cl. 424—122 **6 Claims**

1. A method of treating colon tumors in a mammal, which comprises administering to said mammal an antitumor effective amount of rapamycin in combination with an antitumor effective amount of the antineoplastic agents 5-fluorouracil and cyclophosphamide.

5,066,494

TRANSDERMAL THERAPEUTIC SYSTEM

Frank Becher, Koblenz, Fed. Rep. of Germany, assignor to Lts Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

PCT No. PCT/DE88/00370, § 371 Date Apr. 3, 1989, § 102(e) Date Apr. 3, 1989, PCT Pub. No. WO89/00437, PCT Pub. Date Jan. 26, 1989

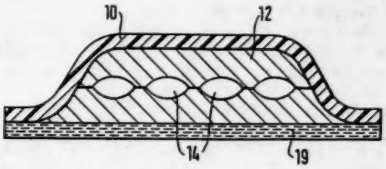
PCT Filed Jun. 21, 1988, Ser. No. 327,810

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1987, 3722775

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 **15 Claims**

1. A transdermal therapeutic system for the controlled administration of active substance to the skin with a backing layer remote from the skin, an active substance depot, an active substance delivery control device controlling the delivery of the active substance through the system and a contact adhesive fixing means for fixing the therapeutic system to the skin, characterized in that the active substance depot is a multichamber system, in which the chambers are interconnected by



channels and are provided with active substance delivery control means.

5,066,495

PROCESSES FOR THE PREPARATION OF PHARMACEUTICAL COMPOSITIONS CONTAINING BROMOCRIPTINE HAVING HIGH STABILITY AND RELATED PRODUCTS

Luigi Moro; Achille Fiori, and Alberto Natali, all of Milan, Italy, assignors to Poli Industria Chimica S. P. A., Milano, Italy

Filed Mar. 30, 1990, Ser. No. 502,520

Claims priority, application Italy, Apr. 7, 1989, 20063 A/89

Int. Cl.[5] A61K *9/48, 9/20*

U.S. Cl. 424—451 **8 Claims**

1. A method for the preparation of a pharmaceutical composition in tablet or capsule form containing the active ingredient bromocriptine base or bromocriptine salified with organic or inorganic acids, which method comprises the following steps: (a) dissolving the active ingredient in a solvent or mixture of solvents capable of producing a solution having a concentration of active ingredient greater than about 10%, said solvent being selected from ethyl and isopropyl alcohol, acetone, ethyl acetate, chloroform, methylene chloride, water and carbon tetrachloride; (b) using the resultant solution to wet an excipient, or mixture of excipients, insoluble in said solution but subject to the swelling action thereof, said excipient being selected from cross-linked polyvinylpyrrolidone, cross-linked sodium carboxymethyl cellulose, calcium carboxymethyl cellulose, alginic acid and salts thereof, starch and derivatives thereof and ion exchange resins, whereby an expanded excipient is obtained; (c) drying said expanded excipient to produce an active ingredient-bearing excipient product having a residual moisture content of less than 1% and subjecting said product to separation; and (d) compressing said product into tablets or distributing it into capsules.

5,066,496

COMPOSITION AND METHOD FOR TREATMENT OF GASTRIC AND DUODENAL ULCERS AND MUCOSAL EROSIONS

Sandor Szabo, Brookline, Mass.; Meryl S. A. Rubin, New Rochelle, N.Y.; Michael Kilbaner, Brookline, and Ahmad R. Kamarei, Lexington, both of Mass.; Robert S. Sinn, New York, N.Y.; Nicholas Catsimpoolas, Newton Ctr., Mass., assignors to Angio-Medical Corporation, New York, N.Y. and Trustees of Boston University, Boston, Mass.

Filed Aug. 3, 1988, Ser. No. 227,739

Int. Cl.[5] A61K *35/30, 35/12*

U.S. Cl. 424—570 **6 Claims**

1. Method for reducing incidence and severity of gastric ulcers caused by aspirin compromising administering to a subject susceptible to aspirin caused ulcers an amount of a pharmaceutically acceptable mixture of bovine brain gangliosides sufficient to reduce incidence and severity of said aspirin caused ulcers from forming.

5,066,497

ANTIMICROBIAL VETERINARY COMPOSITIONS AND METHODS

Roy T. Witkin, Westport, Conn., assignor to Albert L. Jacobs, Jr., Chappaqua, N.Y., a part interest

Continuation-in-part of Ser. No. 225,262, Jul. 28, 1988, Pat. No. 4,935,248. This application Apr. 2, 1990, Ser. No. 503,250
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.
Int. Cl.[5] A61K *33/18, 33/40*
U.S. Cl. 424—616 1 Claim

1. In the technology of applying, spraying, or sponging an antimicrobially effective amount of an aqueous iodophor or peroxide solution to the udder surfaces of cows, or other animals to be milked prior to milking, the improvement which avoids iodides and staining which consists essentially of the step of shampooing said udders with a non-staining shampoo containing (a) from about 0.01% to 2% of iodine in a povidone-iodine complex and (b) about 0.05% to 5% of hydrogen peroxide as a nascent oxygen source, said individual components (a) and (b) being combined, with water, at the time of use and having been maintained dry and out of contact with one another in a container or receptacle.

5,066,498

NUTRITIONAL SUPPLEMENT FOR THE HOOF AND COAT

C. Graham McCauley, III, Versailles, Ky., assignor to McCauley Brothers, Inc., Versailles, Ky.

Continuation of Ser. No. 400,830, Aug. 30, 1989, Pat. No. 5,000,964. This application Mar. 14, 1991, Ser. No. 669,673
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 17 Claims

1. A nutritional supplement composition for the hoof and coat comprising by weight percent substantially:
96.0% to 0.0% palatable carrier;
50.0% to 2.0% methionine;
0.25% to 0.01% biotin;
20.0% to 2.0% live yeast culture and yeast fermentation solubles;
5.0% to 1.25% zinc in chelated form;
0.40% to 0.0% preservative;
1.5% to 0.0% antioxidant agent; and
20.0% to 0.0% flavoring agent.

5,066,499

PROCESS FOR MAKING LOW SODIUM CRACKERS AND PRODUCTS OBTAINED THEREBY

Henry E. Arciszewski, Franklin Lakes; Linda A. Porzio, Kinnelon; Bin Y. Chiang, Cedar Knolls; Clyde E. Spotts, Jr., Ridgewood; Kevin McHugh, Oakland, and Joseph A. Szwerc, Mahwah, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Division of Ser. No. 105,975, Oct. 6, 1987, Pat. No. 4,859,473, which is a continuation of Ser. No. 773,127, Sep. 6, 1985, abandoned, and a continuation-in-part of Ser. No. 584,868, Feb. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 480,431, Mar. 30, 1983, abandoned. This application Mar. 23, 1989, Ser. No. 327,709
Int. Cl.[5] A21D *8/00, 8/04, 8/02*
U.S. Cl. 426—19 35 Claims

1. A crisp cracker baked from a laminated dough composition comprising flour, water, fat or shortening, a leavening agent comprising potassium carbonate and an added acidic component selected from the group consisting of fumaric acid and monobasic calcium phosphate in an amount of about 10% to about 50% by weight of the potassium carbonate, and sodium chloride, the cracker having sodium chloride present as a topping on one of its surfaces, at least about 85 percent by weight of the sodium in the cracker, including the topping, being present as sodium chloride wherein said cracker has a sodium content of less than or equal to 140 mg Na^+ per 14.2 gm serving and has a pH of about 6.5 to about 8.0, said cracker having a substantially uniform laminar cell structure.

5,066,500

INFANT FORMULAS AND NUTRITION PRODUCTS ENRICHED WITH NUCLEOSIDES AND/OR NUCLEOTIDES AND PROCESSES FOR THEIR PREPARATION

Angel H. Gil; Daniel V. Morales, and Eduardo R. Valverde, all of Granada, Spain, assignors to Union Industrial y Agro-Ganadera, S. A. (UNIASA), Granada, Spain

Continuation of Ser. No. 55,858, Jun. 1, 1987, abandoned. This application Oct. 6, 1989, Ser. No. 418,948
Claims priority, application Spain, May 29, 1987, 8701601
Int. Cl.[5] A23C *9/00*
U.S. Cl. 426—72 17 Claims

1. A non-milk based infant formula comprising carbohydrates, a source of amino acids, vegetable oils, minerals, vitamins, wherein the formula contains at least one of uridine, uridine phosphate or mixtures thereof; guanosine, guanosine phosphate or mixtures thereof; adenosine, adenosine phosphate or mixture thereof; cytidine, cytidine phosphate or mixtures thereof or inosine, inosine phosphate or mixtures thereof.

5,066,501

FLUIDIZATION OF SOAPSTOCK

Jeffrey C. Evans, Maple Grove, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 264,633, Oct. 31, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 597,106
Int. Cl.[5] C11B *3/04;* C11C *1/00;* A23K *1/175*
U.S. Cl. 426—74 9 Claims

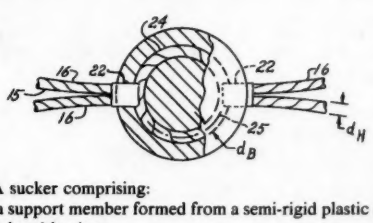
1. A method for treatment of soapstock to provide a fluid, stabilized product useful for animal feed formulation comprising
(a) providing a raw soapstock obtained from alkali refining of a fat, said soapstock comprising from about 30% to about 50% of total fatty acids, from about 25% to about 60% moisture and from about 3% to about 12% of non-fatty components; and
(b) adding propionic acid to said soapstock to provide an acidified soapstock with a pH of about 3 to about 6, said propionic acid being added at a level sufficient to solubilize the gums present in said soapstock.

5,066,502

CONFECTION AND SAFETY SUPPORT HANDLE

George E. Eales, 527 West Olive Ave., Redlands, Calif. 92373

Continuation-in-part of Ser. No. 282,946, Dec. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 48,570, May 11, 1987, abandoned. This application May 8, 1990, Ser. No. 521,320
Int. Cl.[5] A23G *3/00*
U.S. Cl. 426—75 25 Claims



1. A sucker comprising:
(a) a support member formed from a semi-rigid plastic material and having:
(i) a rod-shaped support body portion having substantially uniform cross-section along a curved body axis and forming a closed support loop having a lateral dimen-

sion of the loop sufficiently large for resisting accidental swallowing by a consumer of the sucker;

(ii) a rod-shaped handle portion having substantially uniform cross-section along a curved handle axis between end extremities thereof and forming a closed loop, the semi-rigid material of the handle portion permitting the handle portion to be deformed when grasped, but resilient enough to return to its initial configuration when it is released; and

(iii) a coupling poriton fixably connecting the end extremities of the handle portion for forming the closed, elongate handle loop, the coupling portion connecting the handle portion in spaced relation to the body portion; and

(b) a dissolvable edible material completely enclosing the body portion with the closed loop configuration of the body portion providing positive interlocking engagement of the edible material thereon, the handle loop extending from proximate the edible material, the edible material not contacting the handle portion.

5,066,503

METHOD OF PASTEURIZING OR STERILIZING FOODSTUFFS UTILIZING MICROWAVES

Giuseppe Ruozi, Reggio Emilia, Italy, assignor to Officine Meccaniche Attrezzature per Ceramiche, Italy

Division of Ser. No. 360,798, Jun. 2, 1989. This application Nov. 13, 1990, Ser. No. 611,563

Claims priority, application Italy, Jun. 7, 1988, 40090 A/88

Int. Cl.[5] A23L *3/00*

U.S. Cl. 426—234 **5 Claims**

1. A method of pasterizing or sterilizing packaged foodstuffs using microwaves at 2.450 MHz frequency, comprising the steps of:

(a) batching or arranging the liquid or solid edible product in containers or wrappers wholly transparent to microwave radiation;

(b) introducing the containers or wrappers into and conveying them continuously through an environment that is pressurized to a level of up to 2.5 bar max, dependent upon the properties of the edible product, in order to prevent the containers or wrappers from bursting or becoming distorted, and rendered multiresonant by a diffusion of microwaves from above and below;

(c) raising the temperature of the product initially in said pressurized environment;

(d) stabilizing the temperature reached by initial heating using circulated heated gas in combination with microwave radiation in said pressurized environment;

(e) holding the stabilized temperature using circulated heated gas in said pressurized environment; and

(f) cooling the edible product following sterilization or pasteurization in said pressurized environment.

5,066,504

DEWAXING OF DRIED OIL

Lutz S. Asbeck, Delmenhorst, Fed. Rep. of Germany, and Jacobus C. Segers, Nieuwerkerk a/d IJssel, Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Apr. 24, 1990, Ser. No. 513,716

Claims priority, application United Kingdom, Apr. 28, 1989, 8909804

Int. Cl.[5] A23D *9/00*

U.S. Cl. 426—417 **9 Claims**

1. A method for dewaxing oil, comprising the steps of:

i) drying the oil to a water content of less than 0.5% by wt;

ii) heating the oil to a temperature at which the oil does not contain nucleation seeds for wax crystal formation;

iii) cooling the dried oil from the temperature at which it does not contain nucleation seeds for wax crystal formation, at a cooling rate of less than 15° C. per hour and at a temperature difference between the oil and the coolant medium of less than 15° C., to an oil end temperature being in the range of 2°-10° C. wherein a solid wax is formed; and

iv) removing the solid wax by microfiltration.

5,066,505

COOKING METHOD AND APPARATUS

Peter M. Vos, and David J. Vos, both of Coolbinia, Australia, assignors to Vos Fry Systems Australia Ltd., West Perth, Australia

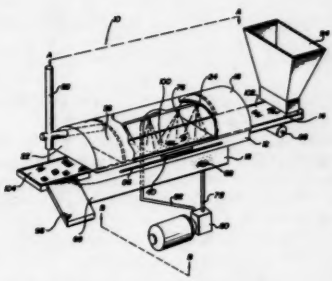
PCT No. PCT/AU87/00119, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO87/06445, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 23, 1987, Ser. No. 283,490

Claims priority, application Australia, Apr. 23, 1987, PH5589

Int. Cl.[5] A21B *5/08;* **A23L** *1/01;* **A47J** *27/14, 37/12*

U.S. Cl. 426—438 **22 Claims**



22. A method of cooking food comprising:

providing a cooking apparatus comprising a housing;

storing cooking fluid in reservoir means;

positioning spray means in said housing for spraying said cooking fluid therefrom;

transferring said cooking fluid from said reservoir means to said spray means via cooking fluid transfer means;

conveying food in a direction of passage from a feed end to a discharge end of said cooking apparatus along conveyor means which comprises at least a first and second set of elongate members extending longitudinally in the direction of passage of said food through said housing with at least one of the elongate members of said first set of elongate members being of undulating form and movable; and

spraying cooking fluid from said spray means onto said food to cook said food as it is conveyed from said feed end to said discharge end while advancingly conveying said food from said feed end to said discharge end in a tumbling manner by said conveyor means.

5,066,506

METHOD OF PREPARING STABILIZED WHOLE GRAIN FLOUR

Dean W. Creighton, Albertville; John D. Efstathiou, Plymouth, and John A. Merboth, Minnetonka, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Jun. 1, 1990, Ser. No. 531,670

Int. Cl.[5] A23B *4/03, 4/044*

U.S. Cl. 426—450 **16 Claims**

1. A method for treating a whole cereal grain that upon milling provides a raw whole cereal grain of enhanced storage stability, consisting essentially of the steps of:

A. introducing an untempered, intact raw whole cereal grain having a starchy content, selected from the group consisting of corn, wheat, rice, amarynth, sorghum, millet, barley, rye, and mixture thereof into a zone of elevated temperature and pressure,

said cereal grain having a moisture content of 9% to 14%, said zone having a temperature ranging from about 500° to

600° F. (260° to 315° C.) and a pressure of about 50 to 70 psig (345 to 483 kPa gauge) for a residence time of about 30 to 60 seconds to form a superheated whole cereal grain having a portion of its starch component gelatinized;

B. conveying the superheated whole cereal grain to a second zone of lower temperature and pressure to form treated substantially unpuffed whole cereal grains having a moisture content of at least 8% and wherein the starchy content is partially gelatinized and has a loss in birefringence of less than 40%; and,

C. cooling the treated unpuffed whole cereal grain to ambient conditions to form an unpuffed stabilized whole cereal grain.

5,066,507

METHOD FOR REMOVING ROOTS FROM CORMATOSE PLANT BODIES

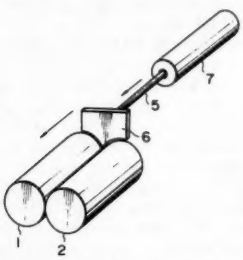
Yoshiyuki Miwa; Hiroshi Kodama; Takuya Murase, all of Tokyo; Sadao Shikae, Kagoshima; Masaya Nakagawa, and Tsutomu Kabumoto, both of Tokyo, all of Japan, assignors to Waseda University and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 20, 1990, Ser. No. 482,628

Claims priority, application Japan, Feb. 22, 1989, 1-40382; Jul. 31, 1989, 1-196935

Int. Cl.[5] A23N *15/00*

U.S. Cl. 426—481 **3 Claims**



1. A method for mechanically removing beard-like roots from harvested cormatose plant bodies using a root removing device, comprising:

supplying the harvested cormatose plant bodies in between two rollers first rotating about substantially horizontal parallel axes with a roller gap between the outer peripheral surfaces of the rollers, the rollers rotating in relative directions with respect to each other so that at least one of the peripheral surfaces of the rollers on opposing adjacent inner sides is moving upwards, in order to allow each plant body to roll on the rollers and become balanced and oriented substantially axially with respect to the rollers;

changing the relative rotation of at least one of the rollers so that the peripheral surfaces on the opposing adjacent inner sides of both rollers are moving downwards;

drawing the beard-like roots of each plant body into the roller gap maintained by a suitable spacing of the rollers;

forcing each plant body away from the rollers by means of a plant body thrusting mechanism to cause the roots to be plucked from the plant body; and

discharging the so disrooted plant body out of the root removing device.

5,066,508

HOMOGENEOUS, STORAGE-STABLE CHOCOLATE MILK COMESTIBLES AND PROCESS OF MAKING

Jean-Luc Schuppiser, Claye Souilly; Antoine Coutant, Paris, and Jean-Claude Bozetto, Chilly Mazarin, all of France, assignors to Rhone- Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 90,502, Aug. 28, 1987. This application Jan. 22, 1990, Ser. No. 465,647

Claims priority, application France, Aug. 28, 1986, 86/12153

Int. Cl.[5] A23C *9/156*

U.S. Cl. 426—584 **14 Claims**

1. An essentially homogeneous and storage-stable liquid chocolate milk, having a viscosity ranging from 10 to 100 mPa.s, comprising a milk base including a suspension of cocoa particulates, and further comprising from 0.01 to less than 0.08% by weight of a suspension stabilizing amount of a xanthan/galactomannan admixture adapted for the formation of an aqueous gel therefrom, wherein the ratio by weight of xanthan/galactomannan ranges from 80/20 to 20/80.

5,066,509

STORAGE STABLE LIQUEUR OR ALCOHOL-CONTAINING BEVERAGE CONTAINING MEDIUM CHAIN TRIGLYCERIDES

Martinus M. G. M. van den Hoven, Veghel, and Hermanus W. A. Ermens, Oploo, both of Netherlands, assignors to DMV Campina B.V., Veghel, Netherlands

Filed Feb. 27, 1990, Ser. No. 485,981

Int. Cl.[5] C12G *3/04;* **A23C** *13/14*

U.S. Cl. 426—592 **16 Claims**

1. A storage stable liqueur or alcohol-containing beverage comprising as ingredients cream, yogurt or another dairy product, and further comprising alcohol-containing liquid, flavoring agents, coloring agents, emulsifiers, stabilizers, sugars or artificial sweetening agents, fats, and acids wherein the fat primarily contains esters of saturated fatty acids mainly having 6–12 carbon atoms, and the beverage comprises from 0.5 to 25 volume % of alcohol.

5,066,510

PROCESS FOR TEMPERING FLAVORED CONFECTIONERY COMPOSITIONS CONTAINING REDUCED CALORIE FATS AND RESULTING TEMPERED PRODUCTS

Albert M. Ehrman; Paul Seiden; Rose M. Weitzel, and Robert L. White, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 452,880, Dec. 19, 1989, which is a continuation-in-part of Ser. No. 329,619, Mar. 28, 1989, Pat. No. 4,888,196. This application Dec. 20, 1990, Ser. No. 630,622

Int. Cl.[5] A23D *9/02*

U.S. Cl. 426—607 **7 Claims**

1. A reduced calorie fat, which comprises:

(a) at least about 85% combined MLM and MML triglycerides;

(b) no more than about 10% combined LLM and LML triglycerides;

(c) no more than about 2% LLL triglycerides;

(d) no more than about 4% MMM triglycerides;

(e) no more than about 10% other triglycerides;

wherein M is a C_6 to C_{10} saturated fatty acid and L is a C_{20} to C_{24} saturated fatty acid residue;

(f) a fatty acid composition having:

(i) from about 35 to about 60% combined C_8 and C_{10} saturated fatty acids,

(ii) a ratio of C_8 to C_{10} saturated fatty acids of from about 1:4 to about 4:1,

(iii) from about 35 to about 60% behenic fatty acid.

5,066,511

METHOD FOR PREPARING PULVERIZED POLYDEXTROSE WHICH IS SUBSTANTIALLY FREE OF ACIDS AND COMPOSITIONS CONTAINING SAME

Subraman R. Cherukuri, Towaco; Kirshna P. Raman, Randolph, both of N.J.; Lucy L. Wong, Jackson Heights; Gul Mansukhani, Staten Island, both of N.Y., and Angel Orama, Stanhope, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 19, 1989, Ser. No. 354,650
Int. Cl.[5] A23L *1/0522;* A23G *3/30*
U.S. Cl. 426—658 10 Claims

1. A method for preparing pulverized Polydextrose substantially free of low molecular weight organic acids and having a particle size of under about 125 microns in diameter and exhibiting reduced moisture pickup and little or no grittiness, which comprises the steps of:

(a) forming a mixture between Polydextrose which is substantially free of low molecular weight organic acids and is incapable of being pulverized to a particle size of under about 125 microns by conventional means, and from about 0.1% to about 5% by weight of the mixture of an anti-caking agent; and

(b) pulverizing the mixture from step (a) to form a pulverized Polydextrose having particles the majority of which are under about 125 microns in diameter;

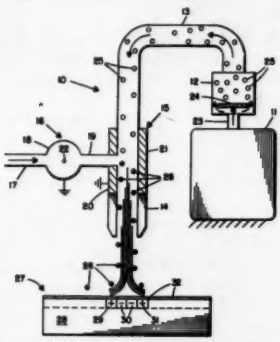
(c) wherein said anti-caking agent stabilizes the static charge of said Polydextrose and thereby facilitates pulverization of the majority of said Polydextrose to the particle sizes of under about 125 microns in diameter.

5,066,512

ELECTROSTATIC DEPOSITION OF LCD COLOR FILTERS

Michael P. Goldowsky, Valhalla, and William B. Pennebaker, Carmel, both of N.Y., assignors to International Business Machines Corporation, Yorktown Heights, N.Y.

Filed Dec. 8, 1989, Ser. No. 448,174
Int. Cl.[5] B05D *5/06, 1/04;* D06P *5/00, 5/20*
U.S. Cl. 427—14.1 16 Claims



13. A method of depositing a liquid dye on the surfaces of selected TFT electrodes present in a matrix of TFT electrodes, comprising the steps of:

forming said dye into droplets;

electrostatically charging said dye droplets to a first potential having a first sign;

biasing selected ones of said TFT electrodes in said matrix to a first potential having said first sign and biasing selected others of said TFT electrodes in said matrix to a second potential having a second sign, said second sign being opposite said first sign; and

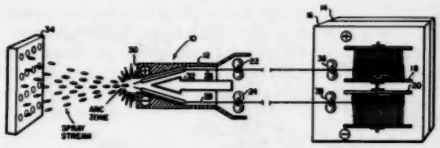
placing said charged dye droplets in proximity to said matrix of electrodes whereby said droplets are selectively attracted to and deposit on said electrodes biased to said second potential.

5,066,513

METHOD OF PRODUCING TITANIUM NITRIDE COATINGS BY ELECTRIC ARC THERMAL SPRAY

Zbigniew Zurecki, Macungie; Edward A. Hayduk, Jr., Blandon; John G. North, Pottstown, and Robert B. Swan, Bath, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 6, 1990, Ser. No. 477,400
Int. Cl.[5] B05D *3/06, 1/04*
U.S. Cl. 427—37 7 Claims



1. A method of improving the mechanical wear resistance of a substrate comprising the steps of:

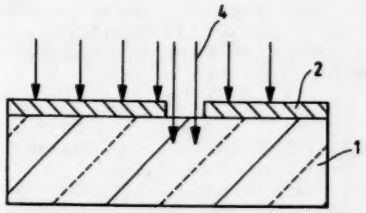
exposing said substrate to an effluent from an electric arc thermal spray gun operated in the atmosphere using a pretreated titanium wire, said titanium wire being pretreated by annealing in nitrogen to increase the nitrogen content of the wire to at least 500 PPM, and a nitrogen gas as the atomizing/propelling gas, whereby a substantially titanium nitride coating is produced on said substrate.

5,066,514

METHOD OF FORMING OPTICAL WAVEGUIDES BY ION IMPLANTATION

Keiji Oyoshi, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 18, 1990, Ser. No. 466,838
Claims priority, application Japan, Jan. 26, 1989, 1-17071; Dec. 5, 1989, 1-315961
Int. Cl.[5] B05D *3/06;* C23C *14/04*
U.S. Cl. 427—38 10 Claims



1. A method of forming an optical waveguide, comprising a step of implanting at least two ionic species into the surface of a substrate, said ionic species being capable of forming an oxide, a nitride or a halide, wherein at least one of said two ionic species is implanted in a portion of said substrate surface which is less than the entire substrate surface, such that said ionic species combine with each other forming said oxide, nitride or halide which is thermally stable in a subsequent heat treatment of said optical waveguide.

5,066,515

ARTIFICIAL DIAMOND FORMING METHOD

Yuzoh Ohsawa, Ohmiya, Japan, assignor to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jul. 16, 1990, Ser. No. 554,135
Claims priority, application Japan, Nov. 21, 1989, 1-302526
Int. Cl.[5] B23K *26/00*; B05D *5/12*
U.S. Cl. 427—53.1 12 Claims

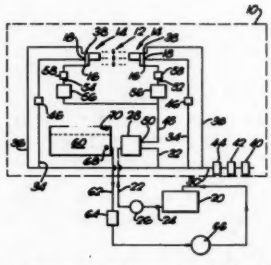
1. A method of forming an artificial diamond, comprising applying a laser beam to an outer surface of a glassy solid carbon material formed of hard carbon formed from an organic substance by solid-phase thermal decomposition thereof, while moving a point at which said laser beam is applied on said outer surface of said glassy solid carbon material so as to cause an outer surface portion of said glassy solid carbon material to be locally fused, to form pools of fused carbon, whereby each of said pools is cooled and solidified as said point moves away therefrom to form an artificial diamond, said laser beam being a carbonic acid gas laser beam and being applied to said outer surface of said glassy solid carbon material in an atmospheric gas flow at a pressure of 200 to 1000 torr at an output density of 1×10^6 to 8×10^6 W/cm^2, said atmospheric gas being a gas selected from the group consisting of He, Ar, N_2, and H_2.

5,066,516

ELECTRICAL CABLE MANUFACTURE

Kenneth R. Emery, Winchester; Harold R. Bennett, Chilbolton, and Jack Clark, Chandlers Ford, all of England, assignors to Pirelli General plc, London, England

Filed Mar. 16, 1989, Ser. No. 324,387
Claims priority, application United Kingdom, Mar. 23, 1988, 8806939; Jan. 31, 1989, 8902074
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—118 16 Claims



1. A method of manufacturing an electrical cable comprising a polymeric sheath extruded over at least one conductor core provided with polymeric insulation, said method including applying a polyol-water mixture over the polymeric insulation of the or each conductor core prior to extruding the polymeric sheath thereover such that the polymeric sheath is prevented from adhering to the polymeric insulation.

5,066,517

METHOD FOR ENHANCING THE PERMANENCE OF PRINTED IMAGES

William J. Hanson, Carlsbad, and J. Randolph Sanders, San Diego, both of Calif., assignors to AcuPrint, Inc., Carlsbad, Calif.

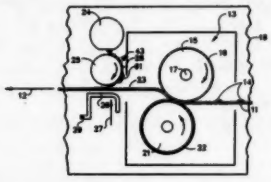
Filed Dec. 12, 1989, Ser. No. 449,780
Int. Cl.[5] B05D *5/00*
U.S. Cl. 427—197 11 Claims

1. A method for enhancing the permanence of printed image elements on a substrate, said method comprising the steps of:

applying lubricant powder to the image elements;

applying pressure to the lubricant powder against the image elements; and

providing enhanced temperature above ambient of the lubricant powder/image element interface;



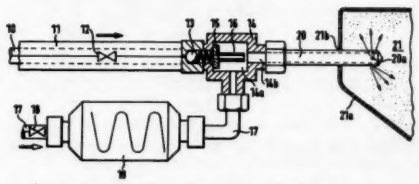
whereby the lubricant powder adheres primarily to the printed image on the substrate and not to the background area of the substrate.

5,066,518

METHOD AND APPARATUS FOR PRESERVING CAVITY SPACES

Willy Klingen, Markdorf, Fed. Rep. of Germany, assignor to J. Wagner GmbH, Fed. Rep. of Germany

Filed Mar. 6, 1990, Ser. No. 490,840
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1989, 3910179
Int. Cl.[5] B05D *7/22*; B05B *7/16, 13/06*
U.S. Cl. 427—236 17 Claims



1. A method for preserving cavity spaces, whereby wax is applied to inside walls of the cavity space to be preserved with application nozzles, comprising the steps:

heating wax to a temperature to liquify the wax between 80° and 140° C.;

supplying the heated and liquified wax to a pre-atomizer nozzle under a pressure between 40 and 150 bar to atomize the wax in the form of a jet of wax drops by said pre-atomizer nozzle;

heating compressed air having a pressure between 0.5 and 5 bar to a temperature between 90° and 160° C.;

mixing said compressed air in its heated condition with the jet of wax drops that has emerged from the pre-atomizer nozzle;

supplying the hot mixture of wax drops and air to the application nozzle; and

spraying the hot mixture of wax drops and air onto the walls of the cavity space to be preserved.

5,066,519

JET WIPING NOZZLE

Malcolm A. Robertson, East Maitland, Australia, assignor to Australian Wire Industries Pty. Limited, Sydney, Australia

Filed Aug. 10, 1989, Ser. No. 392,103
Claims priority, application Australia, Aug. 24, 1988, PJ0032
Int. Cl.[5] B05D *3/04*
U.S. Cl. 429—349 24 Claims

1. In a gas jet wiping process for controlling the film applied from the dip coating of a metal filament through a liquid metal bath, the improvement comprising an annular jet wiping nozzle having:

a) an upper annular part having an upper and a lower annular surface meeting in a substantially sharp annular edge,

b) a lower annular part having an upper and a lower annular surface meeting in a substantially sharp annular edge,

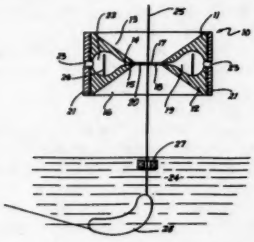
c) an annular gas passage defined between adjacent surfaces of the upper and lower annular parts and terminating between the sharp edges in an annular gas orifice,

d) a filament orifice through which the metal filament passes which is defined by the sharp edges and the annular gas orifice,

e)

(i) the included angle between the upper surface of the upper annular part and the direction of travel of gas leaving the gas orifice being smaller than $(80-x)°$, and

(ii) the included angle between the lower surface of the lower annular part and the direction of travel of gas leaving the gas passage being smaller than $(70+x)°$,



where x is a predetermined angle for the gas wiping nozzle and is the included angle between a plane normal to the direction of movement of the filament through the gas jet wiping nozzle and the direction of gas leaving the gas passage,

f) the lower surface of the lower annular part directly facing the liquid bath and being so disposed that the minimum included angle between that surface and the direction of movement of the filament through the gas jet wiping nozzle is at least 20°, and

g) the upper surface of the upper annular part being so disposed that the minimum included angle between that surface and the direction of movement of the filament through the gas jet nozzle is at least 10°.

5,066,520

METHOD OF PROTECTING POROUS MASONRY

Alan L. Freiberg, Midland; Harold V. Lefler, III, Sanford, and Donald T. Liles, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 15, 1990, Ser. No. 480,681

Claims priority, application Japan, Dec. 27, 1988, 63-327796

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—379 **7 Claims**

1. A process for improving the adhesion of aqueous silicone elastomeric coatings to porous substrates consisting essentially of

(A) coating the porous substrate with an aqueous silicone emulsion which provides an elastomeric coating upon removal of the water, said emulsion having a viscosity of from 0.1 to 10 Pa.s at 25° C. and a pH of from 7.0 to 11.5 inclusive in sufficient amount to provide a continuous primer coating over the surface of the substrate, then

(B) allowing the primer coating to dry to form a film, then

(C) applying a second aqueous silicone emulsion which provides an elastomeric material upon removal of the water over the primer film of (B), said second aqueous silicone emulsion having a solids content of greater than 15 percent by weight and a viscosity of greater than 10 Pa.s at 25° C., then

(D) allowing the second aqueous silicone emulsion to dry to an elastomer.

5,066,521

COMPOSITION AND PROCESS FOR COATING SYNTHETIC FIBERS

Esam M. Morsy, Peoria, Ariz., assignor to Barbara Blair Reiter, New York, N.Y.

Filed Jul. 2, 1990, Ser. No. 546,912

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 **22 Claims**

1. A method of forming a protective film over textile fibers, comprising the following steps:

(a) applying a coating to the fibers from a working solution having the following formulation:

Component	Weight Percent Range
PVP solids	0.50–10.00
Silicone resin	0.01–1.00
Isopropyl alcohol	quantum sufficit
Purified water	0.00–20.00
Fragrance	0.01–0.20
Dye	quantum sufficit
Total	100.00

wherein said coating is permitted to dry until the solvent has been substantially removed.

5,066,522

SUPERCRITICAL FLUIDS AS DILUENTS IN LIQUID SPRAY APPLICATIONS OF ADHESIVES

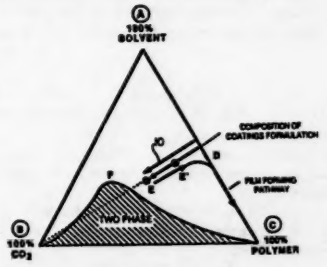
Thomas A. Cole, New Fairfield, Conn., and Kenneth A. Nielsen, Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.

Continuation-in-part of Ser. No. 218,910, Jul. 14, 1988. This application Mar. 22, 1989, Ser. No. 326,945

Int. Cl.[5] B05D *1/02*

U.S. Cl. 427—422 **74 Claims**



1. A process for the liquid spray application of adhesive coatings to a substrate, which comprises:

(a) forming a liquid mixture in a closed system, said liquid mixture comprising:

(i) a solids fraction containing at least one polymeric compound capable of forming an adhesive coating on a substrate;

(ii) a solvent fraction containing at least one active solvent in which said at least one polymeric compound is at least partially soluble and which is at least partially miscible with supercritical fluid; and

(iii) at least one supercritical fluid, in at least an amount which when added to (i) and (ii) is sufficient to render the viscosity of said mixture to a point suitable for spray application; and

(b) spraying said liquid mixture, forming droplets having an average diameter of 1 micron or greater, onto a substrate to form a liquid coating thereon.

5,066,523

PROCESS FOR PRODUCING CORROSION-RESISTANT LAYERS

Hans-Theo Steine, and Christopher Wasserman, both of Lausanne, Switzerland, assignors to Castolin S.A., Sulpice, Switzerland

Continuation of Ser. No. 213,790, Jun. 30, 1988, abandoned. This application Feb. 7, 1990, Ser. No. 476,242

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722533

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] B05D *1/10*

U.S. Cl. 427—423 3 Claims

1. A process for producing a protective metal layer on tubes used in firing installations comprising thermal spraying on the tubes an atomized powder being formed of an alloy consisting essentially of from about 15 to 35% Cr, from about 0.05 to 5.0% Mn, from about 0.01 to 3.0% C, from about 0.1 to 3.0% Si, from about 0.1 to 8.0% Mo, from about 2.0 to 15% Al, and balance Fe.

5,066,524

CRYSTALLIZED GLASS ARTICLE WITH COLORED SMALL MASSES DISPERSED IN A SURFACE THEREOF

Yasuhiro Baba, Hikone, and Masanori Moritake, Nagahama, Takashi Sakane, Kusatsu, Japan; Yoshio Hashibe, Gamou, Japan; Takehiro Shibuya, Yasu, Japan. All of Japan

Filed Sep. 26, 1989, Ser. No. 412,851

Claims priority, application Japan, Sep. 27, 1988, 63-243052

Int. Cl.[5] B44F *9/04*

U.S. Cl. 428—15 5 Claims

5. A heat resistant, incombustible, ornamental wall material for buildings with a colored surface pattern which comprises a substrate of a first crystallized glass of a first color having a surface and small glass masses of a second color dispersed and fusion-bonded in the surface of said substrate, said substrate and said small glass masses cooperatively defining said colored surface pattern, said colored surface pattern composed of a plurality of colored glass masses of said second color dispersed in a surface layer of said substrate of said first color to thereby impart thereto the appearance of a natural building stone.

5,066,525

LAMINATED GLASS PANEL INCORPORATING HOLOGRAM SHEET

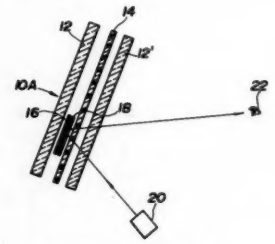
Fumihiko Nakamachi, and Masanori Umebayashi, both of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 18, 1990, Ser. No. 466,852

Claims priority, application Japan, Jan. 25, 1989, 1-7453[U]; Jan. 25, 1989, 1-7454[U]

Int. Cl.[5] B44F *1/10*

U.S. Cl. 428—29 9 Claims



1. A laminated glass panel, comprising:

two transparent glass plates arranged opposite and parallel to each other;

a polyvinyl butyral resin film which contains a plasticizer and is interposed between the two glass plates as adhesive means;

a hologram sheet interposed between said polyvinyl butyral resin film and one of the two glass plates; and

a transparent film which is tightly interposed between said hologram sheet and said polyvinyl butyral resin film so as to shield said hologram sheet from said polyvinyl butyral resin and prevents said plasticizer from transferring from said polyvinyl butyral resin film to said hologram sheet, wherein the surface roughness of said transparent film is not more than 2 μm at least on the side facing said polyvinyl butyral resin film.

5,066,526

THERMOPLASTIC FILMS FOR USE IN STRETCH/CLING APPLICATIONS

Paul M. German, Jr., Friendswood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 123,002, Nov. 19, 1987, abandoned. This application Mar. 14, 1990, Ser. No. 493,174

Int. Cl.[5] B32B *27/08*

U.S. Cl. 428—35.2 14 Claims

1. A thermoplastic stretch/cling film comprising:

a cling layer, absent a tackifying additive, said cling layer comprising a polymer of two or more monomers wherein a first monomer comprises ethylene and a second monomer comprises an acrylate, said polymer comprising an acrylate content of 20% to 30% by weight based upon the weight of said polymer; and

a second layer wherein said second layer comprises a slip layer.

5,066,527

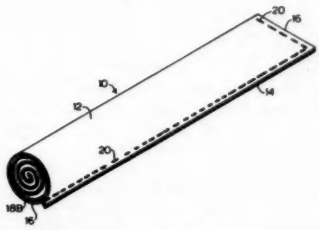
SORPTIVE ARTICLE

Robert D. Newell, Roxboro, N.C., assignor to Newell Industry International, Roxboro, N.C.

Filed Jan. 26, 1990, Ser. No. 471,110

Int. Cl.[5] B27M *3/00*

U.S. Cl. 428—35.6 22 Claims



1. A fluid-sorptive article comprising:

(a) a casing member formed of a liquid permeable material; and

(b) at least one fibrous web element interiorly disposed in the casing member to form interstitial spaces capable of holding fluids.

5,066,528

REFILLABLE POLYESTER CONTAINER AND PREFORM FOR FORMING THE SAME

Suppayan M. Krishnakumar, Nashua; Wayne N. Collette, Merrimack, and Thomas E. Nahill, Amherst, all of N.H., assignors to Continental PET Technologies, Inc., Danbury, Conn.

Filed Mar. 5, 1990, Ser. No. 488,247

Int. Cl.[5] B65D *1/00*

U.S. Cl. 428—36.92 8 Claims

1. In a preform for use in blow molding a container having a concaved bottom and being suitable for refilling, said pre-

form being an injection molded member formed of a polyester, said preform having an elongated body for forming a container body and being closed at one end and open at the opposite end, said preform open end having a neck finish with said preform between said neck finish and said elongated body having a portion tapering in wall thickness for forming a container shoulder portion, said closed one end being defined by a bottom having a generally hemispherical outer surface, and be-

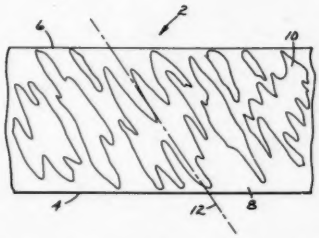
tween said closed one end and said preform body there being a cylindrical container base forming thickened portion of an increased wall thickness as compared to the wall thickness of said preform body, said preform being improved by said bottom also having a generally hemispherical inner surface with the wall thickness of said bottom gradually increasing in thickness towards said preform body and forming means for forming said container concaved bottom with a wall thickness decreasing radially outwardly.

5,066,529

CAMOUFLAGE WRAPPING TAPE

Charles D. Huber, and Donald J. Barry, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 24, 1990, Ser. No. 587,753
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—40 **18 Claims**



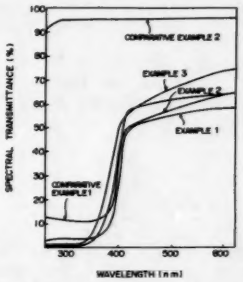
1. A camouflage tape capable of being repeatedly wrapped around an article having a diameter between 1 and 20 cm to provide a pattern giving an appearance of linearity with respect to the axis of said article perpendicular to a cross section of said article, said tape having a width of between 1.5 and 20 cm and having a colored image on at least one surface of said tape, said colored image comprising a background color having a pattern in a different color thereon, said pattern comprising elongate masses which provide the appearance of angularity with respect to the edges of the tape defining the width of said tape, the angularity giving an appearance of angles between 15° and 80° with respect to said edges.

5,066,530

LAMINA AND A COSMETIC COMPRISING THE SAME

Hidekimi Kadokura, and Kunio Saegusa, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 119,092, Nov. 10, 1987, Pat. No. 4,882,143.
This application Sep. 25, 1989, Ser. No. 412,129
Claims priority, application Japan, Nov. 17, 1986, 61-273396
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—98 **15 Claims**



1. A lamina having an excellent capacity to scatter ultraviolet rays comprising:

a laminar substance as a matrix and

a finely divided metal or metal compound dispersed therein,

wherein the difference in refractive index between the laminar substance and the finely divided metal or metal compound is not less than 0.1,

the volume fraction of the finely divided metal or metal compound is 0.1–50%,

the laminar substance has an average thickness of 0.1–5 μm and an average size of 1–500 μm,

the laminar substance is at least one member selected from the group consisting of bivalent or higher polyvalent metals; oxides, nitrides, carbides and hydroxides of the metals; hydrolysates of metal chlorides; partial hydrolysates of organometallic compounds; and inorganic and organic compounds of a higher molecular weight, and

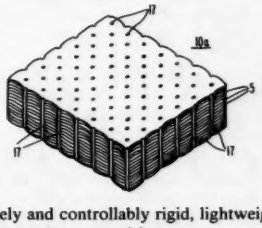
the finely divided metal or metal compound is at least one member selected from the group consisting of bivalent or higher polyvalent metals; oxides, nitrides, carbides and hydroxides of the metals; hydrolysates of metal chorides; partial hydrolysates of organometallic compounds; and metal sulfates.

5,066,531

VARIABLE THICKNESS FOAM PLANK

Warren F. Legg, Worthington, and Wilfred E. Willis, Grayson, both of Ky., assignors to Ametek, New York, N.Y.

Filed Sep. 5, 1989, Ser. No. 403,121
Int. Cl.[5] B32B *3/10, 3/24, 31/00*
U.S. Cl. 428—131 **12 Claims**



1. A relatively and controllably rigid, lightweight flat thermoplastic foam product comprising:

a plurality of laminated thermoplastic foam sheets bonded to one another by melt-bound perforations.

5,066,532

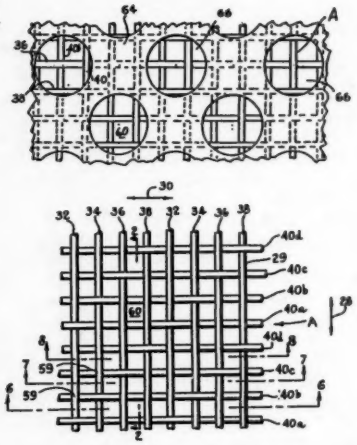
WOVEN MULTILAYER PAPERMAKING FABRIC HAVING INCREASED STABILITY AND PERMEABILITY AND METHOD

Hermann Gaisser, Schlaitdorf, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co., Reutlingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 763,039, Aug. 5, 1985. This application Jul. 16, 1987, Ser. No. 74,339

Int. Cl.[5] B32B *3/00, 3/10;* **D03D** *1/00, 3/04;* **D21F** *7/08*

U.S. Cl. 428—137 **9 Claims**



1. A highly permeable woven multilayer papermaking fabric for a papermaking machine having rollers about which said papermaking fabric travels endlessly, said papermaking fabric having increased fabric stability in the machine direction which corresponds to the direction said papermaking fabric travels on said papermaking machine, the machine direction stability being attributable to the running direction of stacked yarn pairs of said woven papermaking fabric said fabric being of the type which includes a paper support side and a roller contact side facilitating travel as an endless belt in said machine direction wherein said woven fabric comprises:

a first layer of first load bearing yarns in said machine direction on said paper support side of said fabric;

a second layer of second load bearing yarns in said machine direction on said roller contact side of said fabric;

stacked pairs of said machine direction yarns defined by first and second machine direction yarns of said first and second layers arranged in a superposed position one above the other;

a yarn interwoven with said machine direction yarns of said first and second layers in the cross-machine direction thereto to maintain said machine direction yarns stacked upon one another in a weave pattern;

said stacked pairs of machine direction yarns being spaced in the cross-machine direction in said weave pattern to provide a projected open fabric area; and

said projected open area of said fabric being thirty (30%) percent or more of the total fabric area.

5,066,533

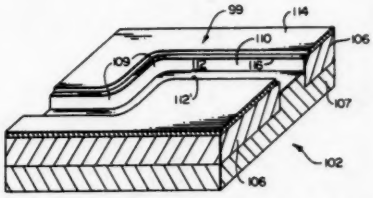
BORON NITRIDE MEMBRANE IN WAFER STRUCTURE AND PROCESS OF FORMING THE SAME

William G. America, Newtown, and Richard R. Poole, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 377,979, Jul. 11, 1989, abandoned. This application Jun. 21, 1990, Ser. No. 540,043

Int. Cl.[5] H01L *21/306;* **B44C** *1/22*

U.S. Cl. 428—156 **6 Claims**



1. A process for forming a step with a smooth wall in a wafer member, comprising diffusing boron into a portion of a selected area of a <100> surface of a silicon wafer member to form a boron diffusion layer, and exposing the selected area to a selective etchant to which the boron diffusion layer is resistant, whereby the boron diffusion layer forms a step adjacent etched silicon in the wafer member with a smooth wall substantially perpendicular to the <100> surface.

5. A miniaturized device comprising a silicon wafer member having a step therein with a smooth wall, formed by the process according to claim **1**, or **2** or **3**.

5,066,534

MAGNETIC RECORDING MEDIUM

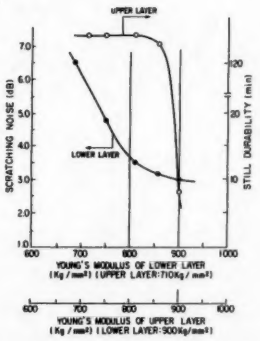
Narito Goto, and Yasuo Ando, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 31, 1990, Ser. No. 560,207

Claims priority, application Japan, Aug. 11, 1989, 1-209271

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—212 **8 Claims**


UPPER LAYER
LOWER LAYER
SCRATCHING NOISE (dB)
STILL DURABILITY (min)
YOUNG'S MODULUS OF LOWER LAYER (Kg/mm²) (UPPER LAYER:710Kg/mm²)
YOUNG'S MODULUS OF UPPER LAYER (Kg/mm²) (LOWER LAYER:900Kg/mm²)

1. A magnetic recording medium comprising a non-magnetic support and provided thereon at least two magnetic layers each containing a ferromagnetic powder and a binder, wherein a lower magnetic layer of the at least two layers has a Young's modulus which is larger than that of an upper magnetic layer of the at least two layers and is not less than 800 kg/mm^2.

5,066,535

FABRIC PATTERNING PROCESS AND PRODUCT

Wesley D. Christie, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 478,057, Feb. 7, 1990, abandoned, which is a continuation of Ser. No. 406,840, Sep. 13, 1989, abandoned, which is a continuation of Ser. No. 45,105, May 1, 1987, abandoned. This application Jul. 25, 1990, Ser. No. 560,465

Int. Cl.[5] B05D *5/00;* D06P *5/12, 5/20, 7/00*

U.S. Cl. 428—196 8 Claims

1. A process for dyeing selected areas of the surface of a textile fabric with an aqueous dye to form a pattern thereon, said process comprising the steps of:

(a) providing a substantially dry fabric having a surface which carries a water-insoluble composition, said composition imparting a substantially uniform hydrophobic character to said fabric surface;

(b) directing a stream of high velocity water to selected areas of said fabric surface comprising said pattern, said water stream having sufficient velocity to overcome said hydrophobic character of said fabric surface and wet said fabric surface in said selected areas, said fabric surface remaining substantially non-wetted elsewhere;

(c) contacting said fabric surface with an aqueous dye, whereby said dye substantially wets and is retained by said fabric only in said selected areas already wetted by said water stream, and is repelled by said hydrophobic character of said non-wetted fabric surface elsewhere;

(d) fixing said dye retained by said fabric in said wetted areas.

5,066,536

FIBRE REINFORCED THERMOPLASTIC COMPOSITE STRUCTURES

Frederic N. Cogswell, Guisborough, and Peter J. Meakin, Saltburn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 6, 1988, Ser. No. 280,355

Claims priority, application United Kingdom, Dec. 10, 1987, 8728887

Int. Cl.[5] B32B *7/02;* D04H *1/58*

U.S. Cl. 428—216 13 Claims

1. A structural thermoplastic composite material comprising a laminate of (a) a first layer of a fibre reinforced composite comprising a first thermoformable polymer and reinforcing filaments at least 50% by weight of which have a length in excess of 3 mm; and (b) a second adherent layer comprising a second thermoformable polymer selected from the group consisting of a crystalline polymer having a melting point at least 10° C. below that of the first polymer, an amorphous polymer having a glass transition temperature which is at least 10° C. lower than the melting point of the first polymer and an amorphous polymer which is crystallisable by annealing, said second adherent layer having been applied to said first layer at a temperature above the melting point of the first polymer.

5,066,537

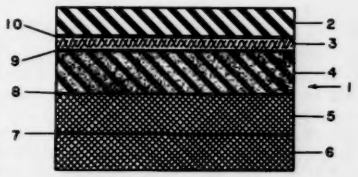
PRINTING BLANKET CONTAINING A HIGH ELONGATION FABRIC

Dennis O'Rell, Boxboro; Parviz Hamed, Upton, and Thomas C. DiPerna, Woburn, all of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 4, 1990, Ser. No. 592,762

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—246 23 Claims



1. A printing blanket comprising a carcass layer, a compressible layer overlaying the carcass layer, a stabilizing layer overlaying the compressible layer and an ink transfer layer upon the stabilizing layer, wherein the stabilizing layer is formed of a fabric having a plurality of continuous filament synthetic warp yarns following a sinusoidal path over and under the weft yarns.

5,066,538

NONWOVEN INSULATING WEBS

William Huykman, Saint Louisville, Ohio, assignor to Ultrafibre, Inc., Granville, Ohio

Division of Ser. No. 224,444 Jul. 25, 1988, Pat. No. 4,933,129. This application Mar. 26, 1990, Ser. No. 499,041

Int. Cl.[5] B32B *7/00;* D02G *3/00*

U.S. Cl. 428—288 4 Claims

1. High performance fibers produced by forming a substantially two-dimensional non-woven web of fibers composed of glass, synthetic polymers or mixtures thereof, said web having a thickness such that at least 50 percent of the fibers is exposed to one or the other side of the web; vacuum metallizing the web with a metal, metal alloy, or mixtures thereof having an emissivity less than 0.1 to produce a web wherein at least 50 percent of the surface area of the web fibers is coated with a metallic material; and shredding the metallized web into individual, coated staple fibers.

5,066,539

MAGNETIC RECORDING MEDIUM WHEREIN THE MAGNETIC LAYER CONTAINS COMPONENTS HAVING SPECIFIED POLAR GROUPS, PARTICLE DIAMETERS AND SURFACE AREAS OR WHICH ARE IN SPECIFIC RELATIVE RATIOS

Makoto Inoue; Hiroshi Miura; Kaneaki Niita; Toshiyuki Sano; Yoshitaka Tsukidate, and Takahiro Miyazaki, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 28, 1990, Ser. No. 500,300

Claims priority, application Japan, Mar. 29, 1989, 1-83698; Mar. 31, 1989, 1-74834

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—328 1 Claim

1. A magnetic recording medium which comprises a nonmagnetic substrate and a magnetic layer formed thereon, said magnetic layer being composed mainly of a ferromagnetic powder having a specific surface area larger than 45 m^2/g and a binder resin having a $—SO_3M$ group or $—OSO_3M$ group or both (where M denotes an alkali metal introduced thereinto, with the amount of said $—SO_3M$ group or $—OSO_3M$ group or both being 0.2 to 0.8 μmol per m^2 of the surface area of the ferromagnetic powder, and said magnetic layer containing a compound having a plurality of carboxyl groups in the molecule, with the amount of said carboxyl groups being 0.5 to 5

μmol per m^2 of the surface area of said ferromagnetic powder, and said magnetic layer also containing carbon having an average particle diameter of 200 to 400 nm and a specific surface area of 5 to 20 m^2/g, with the amount of said carbon being 0.5 to 4 parts by weight for 100 parts by weight of said ferromagnetic powder.

5,066,540

FLAKE MATERIALS IN COATING COMPOSITIONS

Mark F. Mosser, Sellersville; Kevin B. Eddinger, Gilbertsville, and William J. Fabiny, Harleysville, all of Pa., assignors to Sermatech International, Inc., Limerick, Pa.

Division of Ser. No. 233,833, Aug. 16, 1988, Pat. No. 4,863,516, which is a continuation of Ser. No. 6,376, Jan. 23, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 402,796

Int. Cl.[5] B32B *15/04, 5/16*

U.S. Cl. 428—336 **36 Claims**

1. A cured phosphate coating of improved uniform coating thickness and coverage, erosion resistance, impact resistance, bond strength and corrosion resistance, which coating comprises (a) an aqueous acid binder which comprises phosphate ions and ions selected from the group consisting of chromate and molybdate ions and binds (b) a mixture which contains powder of spherical particles, and flakes in a random distribution amongst the particles, wherein said flakes constitute at least about one percent by weight of the mixture, with the proviso that neither the powder nor the flake is zinc or magnesium and that the phosphate ions are present in major proportion and in excess of the ions selected from the group consisting of chromate and molybdate.

5,066,541

HETEROCYCLE OLIGOMER BLENDS

Hyman R. Lubowitz, Rolling Hills Estates, Calif.; Clyde H. Sheppard, Bellevue, and Ronald R. Stephenson, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

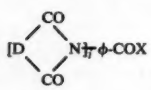
Division of Ser. No. 7,121,964, Nov. 17, 1987, Pat. No. 4,868,270, which is a continuation-in-part of Ser. No. 6,893,124, Aug. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 6,816,490, Jan. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 6,651,826, Sep. 18, 1984, abandoned. This application Dec. 16, 1988, Ser. No. 286,028

Int. Cl.[5] C08K *3/40*

U.S. Cl. 428—378 **24 Claims**

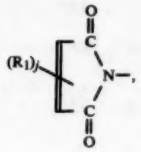
1. A blend comprising an oligomer and a compatible non-crosslinking polymer, wherein the oligomer is formed by reacting:

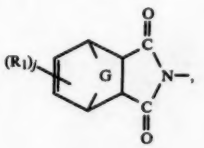
(a) 2 moles of an unsaturated, crosslinking, phenylimide carboxylic acid halide of the general formula:

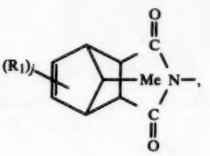


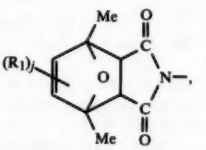
wherein

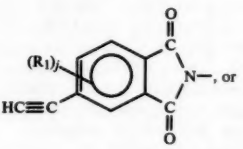
is a radical selected from the group consisting of:

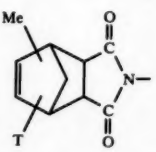






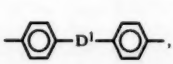






R_1=lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, halogen, or mixtures thereof;
j=2, 1, or 2;
G=—CH_2—, —O—, —S—, or —SO_2—;
T=methallyl or allyl;
Me=methyl;
i=1 or 2; and
X=halogen;

(b) n moles of a diacid halide that includes terminal carboxylic acid halide functionalities attached at the ends of a compound residue selected from the group consisting of:
(I) phenyl;
(II) naphthyl;
(III) biphenyl;
(IV) a polyaryl "sulfone" divalent radical of the general formula:



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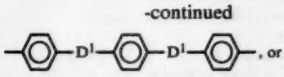
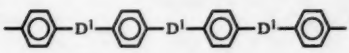
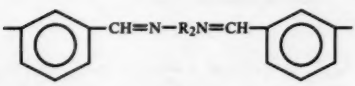
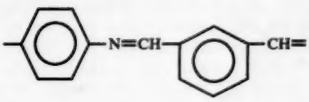


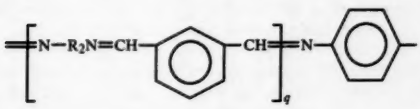


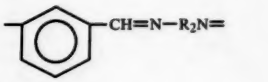
wherein D^1=—S—, —O—, —CO—, —SO_2—, —$(CH_3)_2C$—, —$(CH_3)_2C$—, or mixtures thereof throughout the chain;

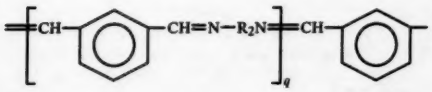
(V) a divalent radical having conductive linkages, illustrated by Schiff base compounds selected from the group consisting of:







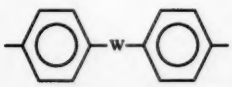




wherein

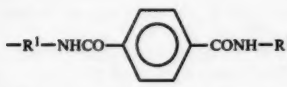
R_2 is selected from the group consisting of: phenyl; biphenyl; naphthyl; or

a divalent radical of the general formula:



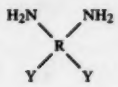
wherein W=—SO_2—, —CH_2—; and q=0-4; or

(VI) a divalent radical of the general formula:

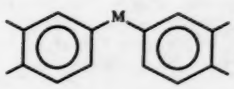


wherein R^1=a C_2 to C_{12} divalent aliphatic, alicyclic, or aromatic radical; and

(c) n+1 moles of at least one four-functional compound of the general formula:



wherein R is selected from the group consisting of compounds of the general formula:



wherein M=—CO—, —SO_2—, —$(CF_3)_2C$—, —S—, or —O—;

Y is selected from the group consisting of —OH, —SH, and —NH_2; and

n is an integer selected so that the oligomer has an average formula weight greater than about 500.

5,066,542

RESIN BLENDS OF MALEIC ANHYDRIDE GRAFTS OF OLEFIN POLYMERS FOR EXTRUSION COATING ONTO METAL FOIL SUBSTRATES

Ricky L. Tabor, and James A. Allen, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 318,049, Mar. 2, 1989, abandoned, which is a continuation of Ser. No. 836,665, Mar. 5, 1986, abandoned, which is a continuation of Ser. No. 641,087, Aug. 15, 1984, abandoned. This application Oct. 15, 1990, Ser. No. 597,630

Int. Cl.[5] **B32B** *27/32, 15/08;* **C08L** *51/06, 23/06*

U.S. Cl. 428—461 **10 Claims**

1. A resin blend for coating metal foil substrates for use at elevated temperatures, said resin blend comprising a polymer blend consisting of about 3 to about 50 percent of grafted HDPE, the remaining percentage consisting of an ungrafted LLDPE,

wherein the grafted HDPE is derived from a grafting reaction with maleic acid or maleic anhydride, and thus contains about 0.1 to about 5 weight percent of succinic acid or succinic anhydride groups,

and wherein the HDPE, before grafting, has a melt index measured according to ASTM D-1238(E) (190° C./2.16 kg) in the range of about 0.1 grams/10 minutes to about 150 grams/10 minutes and a density in the range of about 0.94 grams/cubic centimeter to about 0.965 grams/cubic centimeter, and

wherein the LLDPE copolymer is an ethylene/1-octene copolymer having a density in the range of about 0.88 grams/cubic centimeter to about 0.94 grams/cubic centimeter and a melt index measured according to ASTM D-1238(E) (190° C./2.16 kg) in the range of about 0.1 grams/10 minutes to about 40 grams/10 minutes.

5,066,543

FILM, SHEET AND LAMINATE CAPABLE OF FORMING EASY-OPEN PACKAGINGS

Charles C. Hwo, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 28, 1990, Ser. No. 486,565

Int. Cl.[5] **B32B** *15/08, 27/28;* **C08L** *23/20, 33/02, 33/04*

U.S. Cl. 428—412 **15 Claims**

1. A packaging film or sheet which is capable of forming peel seals, comprising a blend of:

from about 35 percent by weight to about 90 percent by weight of an ethylene unsaturated ester copolymer;

from about 10 percent by weight to about 60 percent by weight of an ethylene-carboxylic acid copolymer; and

from about 5 percent by weight to about 55 percent by weight of a butene-1 homopolymer or copolymer.

5,066,544

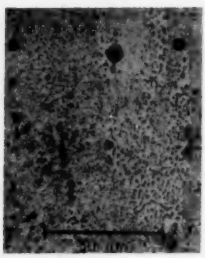
DISPERSION STRENGTHENED LEAD-TIN ALLOY SOLDER

Hemant S. Betrabet, Peekskill; Otmar H. Boser, Scarsdale; Robert H. Kane, Hohokus; Susan McGee, Peekskill, and Thomas Caulfield, Croton Falls, all of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1990, Ser. No. 573,440

Int. Cl.[5] C22C *13/00, 11/06*

U.S. Cl. 428—614 **12 Claims**



1. A dispersion strengthened lead-tin alloy solder comprising up to 5vol. % of particles of a material selected from the group consisting of nickel-tin intermetallics and/or metal sulfide, the size of said particles being less than 5μm.

5,066,545

PROCESS FOR FORMING POLYIMIDE-METAL LAMINATES

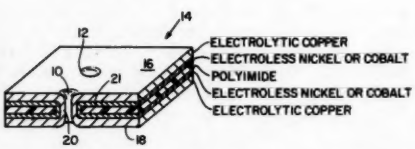
Daniel R. Walsh, Peabody, Mass., assignor to Polyonics Corporation, Newburyport, Mass.

Continuation-in-part of Ser. No. 268,246, Oct. 3, 1988, Pat. No. 4,894,124, which is a division of Ser. No. 155,897, Feb. 16, 1988, Pat. No. 4,868,071, which is a continuation-in-part of Ser. No. 18,346, Feb. 24, 1987, Pat. No. 4,725,504, and a continuation-in-part of Ser. No. 18,342, Feb. 24, 1987, Pat. No. 4,806,395. This application Jan. 12, 1990, Ser. No. 464,230

The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.

Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—626 **3 Claims**



1. A laminate product which comprises a polyimide sheet having at least one through-hole extending between two surfaces of said sheet, said surfaces of said sheet and the surfaces of said through-hole being uniformly and completely hydrophilized, said polyimide sheet surfaces and the surfaces of said at least one through-hole being free of an adhesive and having a metal coating comprising an electroless nickel or cobalt coating and an electrolytic copper coating bonded to each of said nickel or cobalt coatings, said laminate sheet product having a peel strength of at least 6.0 lb./in. as measured by IPC test 2.4.9 Method A and a peel strength of at least 4.5 lb./in. as measured by IPC test 2.4.13 for solder float.

5,066,546

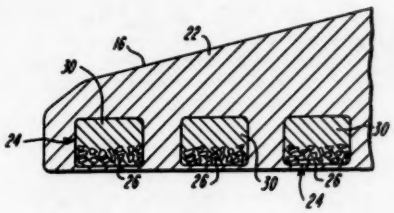
WEAR-RESISTANT STEEL CASTINGS

James P. Materkowski, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 327,667, Mar. 23, 1989, abandoned. This application Dec. 8, 1989, Ser. No. 449,094

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—627 **15 Claims**



8. A tough, wear resistant composite body comprising:

(a) at least one layer of a carbide material selected from the group consisting of tungsten carbide, titanium carbide, tantalum carbide, niobium carbide, zirconium carbide, vanadium carbide, hafnium carbide, molybdenum carbide, chromium carbide, boron carbide, silicon carbide, their mixtures, solid solutions, and cemented composites;

(b) a first casted steel matrix material, wherein said carbide material is embedded in and bonded to said first casted steel matrix to form a wear resistant body; and

(c) a second steel matrix, having a melting point at least 200 degrees F. greater than the melting point of said first steel matrix, wherein said wear resistant body is embedded in and bonded to said second steel matrix.

5,066,547

METAL AND CERAMIC HEAT-CONNECTED BODY

Noboru Ishida; Masaya Ito, and Mitsuyoshi Kawamura, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

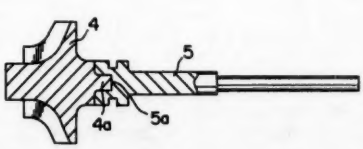
Continuation of Ser. No. 39,602, Feb. 18, 1986, abandoned. This application Jul. 24, 1989, Ser. No. 385,991

Claims priority, application Japan, Feb. 18, 1985, 60-29685

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[5] B32B *15/04*; F04D *29/38*

U.S. Cl. 428—627 **10 Claims**



1. A ceramic/metal composite turbine rotor assembly comprising a ceramic turbine rotor and a metal shaft which have been heat-connected to each other, wherein the ceramic turbine rotor has a coefficient of thermal expansion of about 8.0×10^{-6}/° C. or less and the metal shaft is martensite stainless steel or martensite heat-resistant steel having a Rockwell hardness HRC of at least 40 which has been quench hardened through martensite transformation in a gas or vacuum subsequent to heat-connecting at a temperature higher than the quench hardening temperature of the steel which is at least 800° C.

5,066,548

PROTECTIVE COATED IRON AND STEEL PRODUCTS

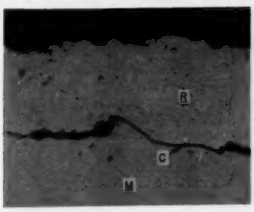
Danièle Quantin, Nogent S/Marne, and Francisco Galdon, Nanterre, both of France, assignors to Institut Recherches de la Siderurgie Francais - IRSID, Maizierer-les-Metz, France

Division of Ser. No. 011538, Feb. 6, 1987. This application Oct. 21, 1988, Ser. No. 218,548

Claims priority, application France, Feb. 6, 1986, 86 01636

Int. Cl.[5] C25D *11/02;* C23C *28/00*

U.S. Cl. 428—629 9 Claims



1. An elongated steel product worked off hot, comprising: a layer of adherent and rough scale with a maximum thickness of about 8 μm, directly coated with a layer of protective material.

5,066,549

HOT DIP ALUMINUM COATED CHROMIUM ALLOY STEEL

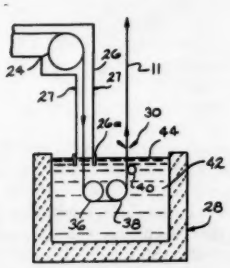
Farrell M. Kilbane, Centerville; Richard A. Coleman, Middletown; Frank C. Dunbar, West Chester, and Alan F. Gibson, Middletown, all of Ohio, assignors to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 16,920, Feb. 20, 1987, Pat. No. 4,800,135, which is a division of Ser. No. 865,238, May 20, 1986, Pat. No. 4,675,214. This application Nov. 22, 1988, Ser. No. 275,147

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] B32B *15/18*

U.S. Cl. 428—653 8 Claims



1. A ferrous base ferritic strip continuously hot dip coated with a coating metal, comprising:

the strip including at least about 6% by weight chromium,

the coating metal including aluminum or aluminum alloys,

the coating layer on the strip being substantially free of uncoated areas and formed without a thick brittle Fe-Al alloy inner layer,

the coating layer being tightly adherent to the strip and resistant to crazing or flaking during bending.

5,066,550

ELECTRIC CONTACT

Kinya Horibe; Tomio Hirano, and Minoru Ikeda, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jul. 25, 1990, Ser. No. 557,102

Claims priority, application Japan, Jul. 27, 1989, 1-92686

Int. Cl.[5] B32B *15/00;* H01H *1/02*

U.S. Cl. 428—670 13 Claims

TABLE

CONTACT EXAMPLE	Ni (CRY) (μm)	Ni (NONCRY) (μm)	Pd (μm)	Au (μm)	R_0 (mΩ)	R_1 (mΩ)	I (R_1/R_0)
A	0	1	0.1	0	0.51	0.52	1.01
B	0	1	0.1	0.1	0.55	0.66	1.20
C	0.7	0.3	0.1	0	0.52	0.84	1.65
D	0.7	0.3	0.1	0.1	0.55	0.75	1.31
E*	1	0	0.1	0	0.54	1012.7	1200
F*	1	0	0.1	0.1	0.53	50.45	95.2
G*	1	0	1	0	0.50	1.23	1.54
H*	1	0	1	0.1	0.57	1.04	1.82

*: COMPARATIVE CONTACTS
R_0: INITIAL RESISTANCE
R_1: RESISTANCE AFTER CORROSION TEST

1. An electric contact comprising:

a) a metallic base layer;

b) a Ni-based layer formed on said metallic base layer and having a thickness of from about 0.8 to about 2 μm, said Ni-based layer being formed with a noncrystal Ni-based layer having a thickness of at least 0.08 μm and with a crystal Ni-based layer having a thickness of less than about 1.92 μm; and

c) a noble-metal-based layer formed on said noncrystal Ni-based layer having a thickness of at least about 0.08 μm.

5,066,551

ELECTROLUMINESCENT SHEET ELEMENT

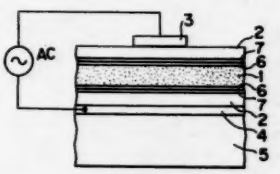
Kiyoaki Kojima, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,761

Claims priority, application Japan, Jan. 27, 1989, 1-18094

Int. Cl.[5] H05B *33/26*

U.S. Cl. 428—690 5 Claims



1. An electroluminescent sheet element comprising:

a fluorescent layer;

first insulating layers provided on opposite sides of said fluorescent layer;

a second thin insulating layer provide adjacent to said fluorescent layer between one of said first insulating layers and said fluorescent layer; and

an intermediate electrode provided adjacent to said one of said first insulating layers between said one of said first insulating layers and said second thin insulating layer.

5,066,552

LOW NOISE THIN FILM METAL ALLOY MAGNETIC RECORDING DISK

James K. Howard, Morgan Hill; Randall G. Simmons, and Tadashi Yogi, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1989, Ser. No. 394,784

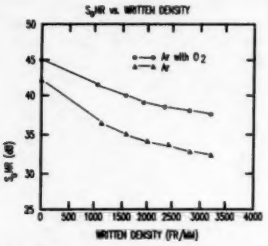
Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—694 8 Claims

1. A magnetic recording disk for horizontal recording comprising:

a rigid substrate; and

a sputter deposited magnetic layer formed over the substrate, the magnetic layer having a composition comprising cobalt, platinum and oxygen, the oxygen being present in the magnetic layer in an amount greater than approximately 5 atomic percent and less than approximately 30 atomic percent.



5,066,553

SURFACE-COATED TOOL MEMBER OF TUNGSTEN CARBIDE BASED CEMENTED CARBIDE

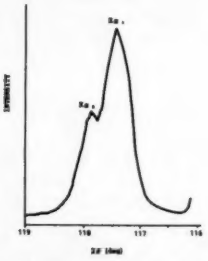
Hironori Yoshimura; Yoshihiro Sawada; Kei Nakahara; Hitoshi Kunugi, and Keiichi Sakurai, all of Tokyo, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 507,665

Claims priority, application Japan, Apr. 12, 1989, 1-92184; Jun. 14, 1989, 1-150923; Aug. 24, 1989, 1-220047; Dec. 15, 1989, 1-325558

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—698 **6 Claims**



1. A surface-coated tool member of tungsten carbide based cemented carbide having a tungsten carbide based cemented carbide substrate containing cobalt and a hard coating formed on said substrate,

wherein the cobalt content of said substrate at a surface portion at a depth of about 2 μm from a surface thereof is less than that at an interior portion at a depth of about 100 μm from said substrate by at least 10%, said surface portion of said substrate having a recrystallized structure exhibiting two X-ray diffraction peaks $K\alpha_1$ and $K\alpha_2$ indexed by index of plane (2,1,1) for tungsten carbide.

5,066,554

FIRE AND MOISTURE PROOF ANODE CONSTRUCTION FOR ALKALINE METAL OR ALKALINE EARTH METAL BATTERIES

Henry F. Hope, and Stephen F. Hope, both of Hope Insturies, Inc., Willow Grove, Pa. 19090

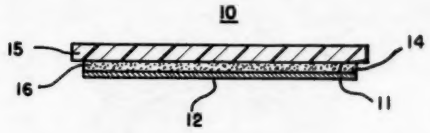
Filed Mar. 26, 1990, Ser. No. 498,696

Int. Cl.[5] H01M *6/14*

U.S. Cl. 429—48 **14 Claims**

1. In an alkaline metal or alkaline earth metal battery which has an anode at least a portion of which is of alkaline metal or alkaline earth metal with at least one exposed surface not in contact with battery material the improvement for protection which compromises

a layer of compatible protective material adjacent to and overlying said exposed surface of said anode, and



a coating of compatible adhesive on said layer of material and in adherent contact with said exposed surface of said anode.

5,066,555

CONTACT ARRANGEMENT FOR A GALVANIC BATTERY

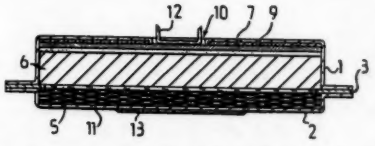
Pentti J. Tamminen, Espoo, Finland, assignor to Sporax Oy, Helsinki, Finland

Continuation of Ser. No. 653,485, Sep. 21, 1984, abandoned, which is a continuation of Ser. No. 368,540, Apr. 15, 1982, abandoned. This application Nov. 13, 1985, Ser. No. 797,763

Claims priority, application Finland, Apr. 27, 1981, 811312

Int. Cl.[5] H01M *6/46, 2/24*

U.S. Cl. 429—121 **11 Claims**



1. Contact arrangement for a battery cell of a galvanic battery comprising

(a) a positive mass layer;

(b) a negative electrode layer;

(c) a separator layer arranged between the positive mass layer and the negative electrode layer so as to separate each from the other;

(d) a positive current collector connected to the positive mass layer;

(e) a case of an insulating material which hermetically encloses the active components of the battery cell in a vacuum;

(f) contact units to create contact through the case with the positive current collector and with the negative electrode layer, respectively, and

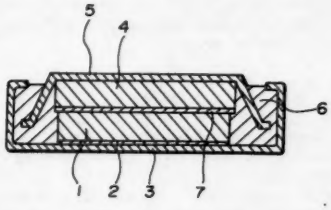
(g) at least one additional insulation layer of a tough and adhesive material and which is limited by the case, so as to maintain the hermetic nature of the case despite the passing-through of the contact unit, wherein the additional insulation layer is at least on the negative side of the cell fitted onto the outer face of the case so that the contact unit, when passing into the case, first penetrates through the said additional insulation layer in a hermetic engagement with the additional insulation layer so as to maintain the vacuum in the cell.

5,066,556

NON-AQUEOUS ELECTROLYTE SECONDARY CELL

Shinichi Toyosawa, Tokorozawa; Masao Ogawa, Kawagoe; Yoshitomo Masuda, Tachikawa; Hideharu Daifuku, Akishima, and Takahiro Kawagoe, Tokorozawa, all of Japan, assignors to Bridgestone Corporation, Tokyo and Seiko Electric Components Ltd., Sendai, both of, Japan

Filed Mar. 23, 1990, Ser. No. 497,883
Claims priority, application Japan, Mar. 31, 1989, 1-78071
Int. Cl.[5] H01M 4/60, 10/40
U.S. Cl. 429—194 6 Claims



1. In a nonaqueous electrolyte secondary cell comprising a positive electrode having a polyaniline as an active material, a negative electrode electrically insulated from the positive electrode, a nonaqueous electrolyte, and an outer casing having these compounds received therein, the outer casing including mutually insulated segments associated with the positive and negative electrodes,

the improvement wherein said positive electrode is affixed to the inner surface of the outer casing segment associated with said positive electrode through a polymer layer formed by applying a polymer aqueous solution comprised of a polyacrylic acid or copolymer of acrylic acid and an acrylate dissolved in water and containing carbon fine powder to said positive electrode or outer casing segment and then drying.

5,066,557

STYRENE BUTADIENE COPOLYMERS AS BINDERS IN MIXED PIGMENT GENERATING LAYER

Susan Robinette, Pittsford; Anita P. Lynch, Webster; Thomas R. Hoffend, Webster; Edward F. Grabowski, Webster, and Kathleen M. Carmichael, Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1989, Ser. No. 459,339
Int. Cl.[5] G03G 5/09
U.S. Cl. 430—58 20 Claims

1. An electrophotographic imaging member comprising a charge generating layer comprised of a homogeneous dispersion of a mixture of photoconductive particles of trigonal selenium and photoconductive particles of phthalocyanine dispersed in a styrene-butadiene copolymer.

5,066,558

DEVELOPER FOR DEVELOPING ELECTROSTATIC IMAGES

Norio Hikake, and Naoto Kitamori, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,297
Claims priority, application Japan, Sep. 30, 1988, 63-246303
Int. Cl.[5] G03G 9/08
U.S. Cl. 430—109 15 Claims

1. A developer for developing electrostatic images, comprising: 100 wt. parts of a toner comprising toner particles and 0.01–3 wt. parts of silica powder (C) which has a particle size of 0.005–0.2 micron and is not fixed to the surfaces of the toner particles;

said toner particles and said silica powder (C) having been dispersed and mixed with each other by means of a mixer having a stirring vane rotating at a peripheral speed at the tip of the stirring vane of 5–50 m/sec;

said toner particles comprising 100 wt. parts of colored resinous particles (A) and 0.05–5 wt. parts of silica powder (B) comprising silica particles which have a particle size of 0.002–0.2 micron and have been embedded in the surfaces of the colored resinous particles (A) by a mechanical impact means; and

the amount of the silica powder (B) embedded in the surface of the colored resinous particles (A) is larger than the amount of the silica powder (C) not being fixed to the surfaces of the toner particles.

5,066,559

LIQUID ELECTROPHOTOGRAPHIC TONER

Mohamed A. Elmasry, Woodbury, and Kevin M. Kidnie, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 22, 1990, Ser. No. 468,153
Int. Cl.[5] G03G 9/12
U.S. Cl. 430—111 30 Claims

1. A liquid toner for developing an electrostatic image comprising copolymer particles dispersed in a non-polar carrier liquid, said copolymer particles comprising a thermoplastic resinous core substantially insoluble in said carrier liquid, and chemically anchored to said core a copolymeric steric stabilizer soluble in said carrier liquid and having chemically bonded thereto moieties containing organic acids having a pKa less than 4.5 to which acids are chemically bonded metal soap compounds derived from organic acids with a pKa of greater than 4.5, said metal soap compounds imparting a positive charge to said liquid toner.

5,066,560

PROCESS FOR PRODUCING TONER FOR ELECTROPHOTOGRAPHY

Ryoji Tan; Shigeyoshi Tanaka; Ken-ichi Kishi; Yasuyuki Iguchi; Takeo Kudo; Takashi Amano, and Hideki Kohno, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Division of Ser. No. 501,733, Mar. 30, 1990, Pat. No. 4,983,488, which is a continuation of Ser. No. 724,202, Apr. 17, 1985, abandoned. This application Sep. 7, 1990, Ser. No. 578,632
Claims priority, application Japan, Apr. 17, 1984, 59-77064; Apr. 23, 1984, 59-81483; Jan. 21, 1985, 60-8917; Jan. 21, 1985, 60-8918; Jan. 21, 1985, 60-8919
Int. Cl.[5] G03G 9/087; C08L 29/04, 27/12
U.S. Cl. 430—137 21 Claims

1. A process for producing a toner for electrophotography which comprises polymerizing a polymerizable monomer dispersed by emulsification in the presence of a colorant and/or a magnetic powder to prepare a principal resin component, and then effecting the coagulation of the resulting polymerization liquid by adding a coagulating agent and at a temperature now lower than the glass transition point of the principal resin component so that the particles in the liquid after coagulation have diameters suitable as a toner.

20. A process for producing a toner for electrophotography which comprises polymerizing a polymerizable monomer dispersed by emulsification in the presence of a colorant and/or a magnetic powder to prepare a principal resin component, and then effecting the coagulation of the resulting polymerization liquid in such a way that the particles in the liquid after coagulation have diameters suitable as a toner.

5,066,561

METHOD FOR PRODUCING AND USING A POSITIVE PHOTORESIST WITH O-QUINONE DIAZIDE, NOVOLAK, AND PROPYLENE GLYCOL ALKYL ETHER ACETATE

Thomas R. Pampalone, Flemington, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 263,968, Oct. 27, 1988, abandoned, which is a continuation of Ser. No. 914,217, Oct. 2, 1986, abandoned, which is a continuation of Ser. No. 791,252, Oct. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,468, Jun. 11, 1984, Pat. No. 4,550,069. This application Mar. 28, 1990, Ser. No. 501,970

Int. Cl.[5] G03F *7/30, 7/022, 7/023*

U.S. Cl. 430—169 **20 Claims**

1. A method of producing and using a photoresist which consists essentially of:

a) forming a photosensitive composition containing a mixture of (i) at least one novolak resin, (ii) at least one o-quinone diazide photosensitizer, said resin and said photosensitizer being present at a relative proportion of from about 15 to 99 parts by weight resin and about 1 to 85 parts by weight photosensitizer based on the weight of the solids portion of the photosensitive composition, and (iii) a solvent composition consisting essentially of a propylene glycol alkyl ether acetate present in an amount of from about 40% to about 90% by weight of the overall photosensitive composition;

b) coating said composition on a substrate;

c) drying said composition such that it is substantially nontacky but contains residual solvent to form a photoresist composition;

d) imagewise exposing the dried photoresist composition to actinic radiation; and

e) removing the exposed areas with an aqueous alkaline developer.

5,066,562

METHOD OF HEATING IMAGE FORMATION SHEET

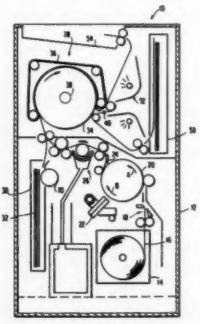
Hiroshi Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 324,786

Claims priority, application Japan, Mar. 17, 1988, 63-64513

Int. Cl.[5] G03C *5/00, 11/00;* **G03F** *7/34*

U.S. Cl. 430—203 **21 Claims**



1. A method of heating an image formation sheet during heat development of said image formation sheet using a drum having a peripheral surface, a length of which is a contact portions comprising the steps of:

producing a latent image on said image formation sheet by exposing said sheet; and

heating and developir.g said image formation sheet on which said image is exposed, wherein

when the total length of said image formation sheet is greater than the length of said contact portion on the periphery of the drum, said image formation sheet is heated while being continuously conveyed onto, conveyed across and conveyed from said contact portion at a first sped which is maintained constant so that the heating time required for development for the entire sheet is more than a given value, and

when said total length of said image formation sheet is less than said length of said contact portion on said periphery of said drum, said image formation sheet is wound around the periphery of said drum at a second speed higher than the first constant speed and caused to assume a stationary state on the surface of said drum, and the heat development is carried out in said stationary state, and the sheet is subsequently separated from said drum at the speed higher than the constant speed.

5,066,563

PHOTOGRAPHIC ELEMENT

Toshiaki Aono; Koichi Nakamura, and Takeshi Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 298,239, Jan. 12, 1989, abandoned, which is a continuation of Ser. No. 157,815, Feb. 19, 1988, abandoned, which is a division of Ser. No. 811,859, Dec. 20, 1985, abandoned. This application Jul. 23, 1990, Ser. No. 559,536

Claims priority, application Japan, Dec. 28, 1984, 59-277778

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—213 **5 Claims**

1. A dye-fixing material for accepting diffusible dyes diffused from a light-sensitive, dye releasing material, said dye-fixing material comprising a support, and provided on the same side of said support at least one mordant layer and a layer containing a saponified product of a copolymer composed of at least one vinyl ester and an ethylenically unsaturated carboxylic acid or derivative thereof selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, itaconic acid, maleic acid, fumaric acid, maleic acid anhydride, itaconic acid anhydride, esters of these compounds, acrylamide, and methacrylamide, and wherein a mordant in said mordant layer is a polymer mordant selected from the group consisting of (a) polymers containing tertially amino group-containing vinyl monomer units, and (b) polymers containing tertially imidazole group-containing vinyl monomer units and wherein said layer containing a saponified product of a copolymer composed of at least one vinyl ester and an ethylenically unsaturated carboxylic acid or derivatives thereof has a degree of swelling of 5 or more.

5,066,564

PHOTOPOLYMERIZABLE MIXTURE AND RECORDING MATERIAL PRODUCED THEREFROM

Rudolf Zertani, Mainz-Bretzenheim; Dieter Mohr, Budenheim, and Klaus Rode, Suzano-SP, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 19, 1989, Ser. No. 381,828

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1988, 3824903

Int. Cl.[5] G03F *7/029*

U.S. Cl. 430—284 **18 Claims**

1. A photopolymerizable mixture comprising, in admixture:

a) a polymeric binder in an amount sufficient to form a uniform film,

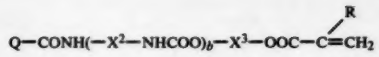
b) an acrylate or alkacrylate of a polyhydric alcohol,

c) a photoreducible dye,

d) a trihalomethyl compound that can be cleaved by irradiation, and

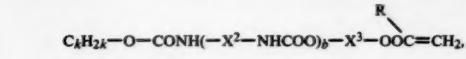
e) an acridine, phenazine or quinoxaline compound that acts as photoinitiator,

wherein the acrylate or alkacrylate is a compound of the formula I



in which
Q denotes

R denotes a hydrogen atom, a methyl group or an ethyl group,
X^2 denotes a saturated hydrocarbon group having 2 to 12 carbon atoms,
X^3 denotes a saturated hydrocarbon group which may be interrupted by 1 to 5 ether oxygen atoms,
D^3 denotes a saturated hydrocarbon group having 4 to 8 carbon atoms, which together with the nitrogen atom forms a 5- or 6-membered ring,
Z denotes a hydrogen atom or a group of the formula



b denotes zero or 1, and
k denotes an integer from 1 to 12, it being possible for all radicals of the same definition to be identical to or different from one another,
wherein components b, c, d and e are present in amounts sufficient to cause polymerization of component b in response to exposure to actinic radiation.

5,066,565
SELECTIVE PROTECTION OF POLY(TETRA-FLUOROETHYLENE) FROM EFFECTS OF CHEMICAL ETCHING

Robert J. Martinez, and Robert R. Rye, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 29, 1989, Ser. No. 330,032
Int. Cl.[5] G03F *7/30*
U.S. Cl. 430—296 **9 Claims**

1. A photolithographic method for treating an article formed of poly(tetrafluoroethylene), comprising:
(1) subjecting portions of a surface of said article to ionizing radiation; and then
(2) subjecting said surface to chemical etching.

3. A photolithographic method according to claim 1, wherein said ionizing radiation comprises low-energy electrons.

5,066,566
RESIST MATERIALS

Anthony E. Novembre, Union, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1990, Ser. No. 560,517
Int. Cl.[5] G03F *7/039, 7/32, 7/36*
U.S. Cl. 430—296 **9 Claims**

1. A process of fabricating a device comprising the steps of exposing in a pattern a radiation sensitive material to radiation, developing a pattern in said material and using said pattern in said material as a mask in a subsequent step in said fabricating process characterized in that said radiation sensitive material comprises a polymer having a backbone chain and pendant substituents wherein a moiety is present in said backbone that induces scission of said backbone to form an acid upon said exposure and developing, wherein said substituents react with acid, and wherein there is a substantial absence of an acid generator in said material other than said polymer.

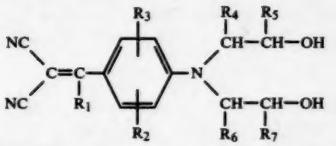
2. The process of claim 1 wherein said radiation comprises electrons.

5,066,567
IMAGE REVERSAL PROCESS UTILIZING A POSITIVE-WORKING PHOTOSENSITIVE COMPOSITION CONTAINING A DYE

Hans-Joachim Merrem, Seeheim-Jugenheim; Gerhard Buhr, Koenigstein, and Ruediger Lenz, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 260,307, Oct. 20, 1988, Pat. No. 4,927,732.
This application Mar. 28, 1990, Ser. No. 500,201
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735852
Int. Cl.[5] G03C *5/00, 1/52*
U.S. Cl. 430—325 **18 Claims**

1. A process for the production of a relief pattern according to the image reversal process, the process comprising the steps of:
coating a support with a photosensitive composition comprising in admixture a photosensitive compound selected from the group consisting of (a) a combination of a photolytic acid donor and an acid-cleavable compound containing a C—O—C group and (b) an o-quinone diazide, in an amount sufficient to change the solubility of areas of a layer of the composition that have been exposed to actinic light, a binder that is insoluble in water and soluble or swellable in an aqueous-alkaline solution in an amount sufficient to produce a uniform film when the composition is coated on the support, a crosslinking agent in an amount sufficient to effect crosslinking of the binder and a dye comprising a non-bleachable compound that absorbs light in the actinic region and corresponds to the general formula I



(I)

wherein
R_1 denotes hydrogen, alkyl, aryl, alkoxy or nitrilo,
R_2 and R_3 are identical or different and denote hydrogen, hydroxy, alkyl, aryl, alkoxy, aryloxy, nitrilo, amino, alkylamino or halogen, and
R_4, R_5, are identical or different and denote
R_6 and R_7 hydrogen, hydroxy, alkyl, aryl, alkoxy, aryloxy, amino, alkylamino or halogen,
the dye being present in an amount sufficient to reduce interference effects on optical resolution,
drying the layer,
imagewise exposing the layer to actinic light, then
subjecting the layer to an overall reexposure by means of actinic radiation, and then
developing the layer with an aqueous-alkaline solution to remove the imagewise unexposed areas and achieve image reversal.

5,066,568

METHOD OF DEVELOPING NEGATIVE WORKING PHOTOGRAPHIC ELEMENTS

Shane Hsieh, Bridgewater, and Wayne A. Mitchell, Bound Brook, both of N.J., assignors to Hoehst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 762,602, Aug. 5, 1985, Pat. No. 4,980,271.
This application Sep. 24, 1990, Ser. No. 587,210
Int. Cl.[5] G03C 5/29
U.S. Cl. 430—325 14 Claims

1. A method for preparing a photographic element which comprises imagewise exposing a photographic element, and removing the non-image areas thereof by contacting said element with a composition consisting essentially of in admixture:

a) from at least about 5% to about 30% by weight of the developer of benzyl alcohol; and

b) from about 1% to about 20% by weight of the developer of one or more compounds selected from the group consisting of sodium xylene sulfonate and sodium cumene sulfonate; and

c) from about 5% to about 40% by weight of the developer of potassium toluene sulfonate; and

d) water in sufficient amount to formulate an effective developer for imagewise exposed photographic elements.

5,066,569

METHOD OF PROCESSING SILVER HALIDE PHOTOGRAPHIC MATERIALS

Toshiharu Nagashima, and Kazuhiro Yoshida, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 19, 1990, Ser. No. 615,177
Claims priority, application Japan, Nov. 20, 1989, 1-301423
Int. Cl.[5] G03C 5/38
U.S. Cl. 430—393 17 Claims

1. A method of processing an imagewise exposed silver halide photographic material that has photographic constituent layers on a side of a support with an automatic processor, comprising:

circulating a fixing solution in a fixing bath being discharged in a volume of 30–200% per minute of a capacity of said fixing bath and at a flow rate of not less than 20 m per minute,

wherein said silver halide photographic material has a gelatin content of not more than 3.0 g/m^2 in said photographic constituent layers, and

said photographic constituent layers comprise a silver emulsion layer which contains silver halide grains having a (100) face to (111) face area ratio of not less than 5.

5,066,570

WET PROCESSING OF SILVER HALIDE PHOTOSENSITIVE MATERIAL

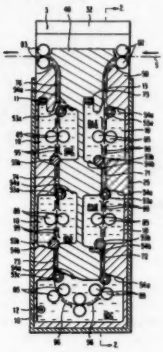
Takashi Nakamura, Minami, and Toshio Kurokawa, Odawara, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 592,413, Oct. 2, 1990, which is a division of Ser. No. 499,746, Mar. 27, 1990, Pat. No. 4,980,714.
This application Oct. 22, 1990, Ser. No. 600,933
Claims priority, application Japan, Apr. 19, 1989, 1-99855
Int. Cl.[5] G03C 5/39
U.S. Cl. 430—421 17 Claims

1. In a method for wet processing a silver halide photosensitive material after development by desilvering the photosensitive material with a processing solution having a desilvering function in a processing tank, the improvement comprising the steps of:

providing a plurality of compartments partitioned in the processing tank and serially connecting the compartments to define a continuous processing path having an entrance and an exit for the photosensitive material,

filling the processing path with the processing solution such that the processing solution in at least one compartment has a different composition from the processing solution in at least one of the remaining compartments, and



successively passing the photosensitive material through the compartments of the processing path without contact with the ambient air.

5,066,571

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOSENSITIVE MATERIAL

Kazuaki Yoshida, and Takatoshi Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1989, Ser. No. 416,690
Claims priority, application Japan, Oct. 3, 1988, 63-249250
Int. Cl.[5] G03C 5/24
U.S. Cl. 430—489 14 Claims

1. A method for processing a silver halide color photosensitive material which comprises developing a color photographic light-sensitive material comprising a support having thereon having at least one light-sensitive silver halide emulsion layer containing a silver halide comprising at least 98 mol % silver chloride;

in a color developer solution comprising a primary amine color developing agent, and having a chloride concentration of from 4×10^{-2} to 1×10^{-1} mol/l, and a bromide ion concentration of from 5.0×10^{-5} to 5×10^{-4} mol/l.

5,066,572

CONTROL OF PRESSURE-FOG WITH GELATIN-GRAFTED AND CASE-HARDENED GELATIN-GRAFTED SOFT POLYMER LATEX PARTICLES

Kevin M. O'Connor, Webster; Richard P. Szajewski, Rochester, and Pranab Bagchi, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 22, 1990, Ser. No. 497,456
Int. Cl.[5] G03C 1/46
U.S. Cl. 430—503 31 Claims

1. A substantially less pressure sensitive silver halide photographic film comprising at least one light sensitive silver halide element, and at least one cushioning layer, not containing photosensitive silver halide, incorporating composite particles comprising a soft polymer core having a mean diameter from about 10 nm to 500 nm covered with a layer of gelating shell that is chemically bonded to the soft polymer particle and

cross-linked with a conventional hardener to form a hard case, whose thickness is less than 10 nm wherein said cushioning

layer is situated in between two silver containing color recording layers of a multilayer color photographic product.

5,066,573

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Tetunori Matushita; Morio Yagihara, and Kei Sakanoue, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

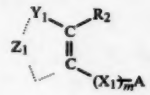
Continuation of Ser. No. 230,830, Aug. 11, 1988, abandoned. This application Feb. 12, 1990, Ser. No. 480,348

Claims priority, application Japan, Aug. 11, 1987, 62-200233

Int. Cl.[5] G03C *1/08*

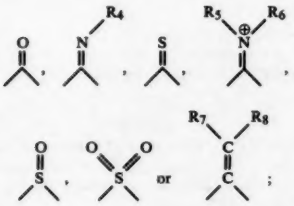
U.S. Cl. 430—542 **19 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one of a silver halide emulsion layer and other hydrophilic colloid layers, wherein the silver halide emulsion layer or the hydrophilic colloid layer contains at least one compound represented by formula (II):

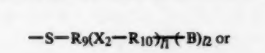


(II)

wherein Z_1 represents an atomic group necessary for forming a carbocyclic ring or a heterocyclic ring; R_2 represents a hydrogen atom or a group that can be substituted; Y_1 represents



R_4, R_5, R_6, R_7 and R_8, which may be the same or different, each represents a hydrogen atom or a group that can be substituted; X_1 represents a divalent linking group containing a hetero atom connected to the carbon atom; m is 0 or 1; A represents a bleach accelerating agent moiety represented by



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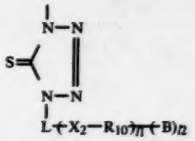
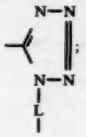
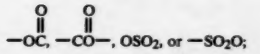


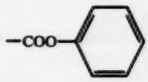
wherein R_9 represents a divalent, trivalent or tetravalent aliphatic group having from 1 to 8 carbon atoms or



L represents a divalent, trivalent or tetravalent aliphatic group having from 1 to 8 carbon atoms; X_2 represents an oxygen atom, a sulfur atom,



R_{10} represents a divalent, trivalent or tetravalent aliphatic group having 1 to 8 carbon atoms; B represents a group selected from the group consisting of —COOM, —$COOCH_3$, —$COOC_2H_5$,



and —OH, wherein M represents a hydrogen atom, an alkali metal atom, a quaternary ammonium group, or a quaternary phosphonium group; l_1 is 0, 1, 2 or 3, provided that when l_1 is 2 or 3, the plural X_2–R_{10} groups may be the same or different; and l_2 is 1, 2 or 3, provided that when l_2 is 2 or 3, the plural B groups may be the same or different; and wherein an amount of the compound represented by formula (II) to be added is from 0.01 mol % to 100 mol % based on the total amount of said silver.

5,066,574

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A NOVEL YELLOW COUPLER

Toru Kubota; Mayumi Tomotake; Hidenobu Ohya; Atsushi Tomotake, and Noboru Mizukura, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 591,293

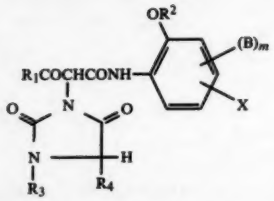
Claims priority, application Japan, Oct. 8, 1989, 1-262776; Oct. 12, 1989, 1-266009; Oct. 12, 1989, 1-266010

Int. Cl.[5] G03C *7/36*

U.S. Cl. 430—557 **10 Claims**

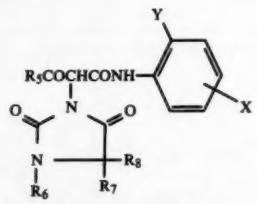
1. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer, wherein at least one of said emulsion layers contains a coupler represented by the following Formula (I), (II) or (III):

Formula (I)



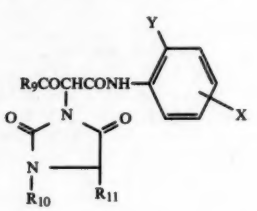
Wherein R_1 and R_2 independently represent an alkyl group, cycloalkyl group or aryl group; R_3 and R_4 independently represent an alkyl group or cycloalkyl group; B represents a substituent; m represents an integer of from 0 to 3; and X represents an acylamino group, sulfonamide group, oxycarbonyl group, carbamoyl group, sulfamoyl group, carbonyloxy group, oxycarbonylamino group, ureido group or sulfonyloxy group;

Formula (II)



wherein R_5 represents wherein an alkyl group or cycloalkyl group; R_6 and R_7 independently represent an alkyl group or cycloalkyl group, and R_8 represents a hydrogen atom, alkyl group or cycloalkyl group, provided that the total carbon number of R_6, R_7 and R_8 is 7 or less; X is the same as defined in Formula (I); and Y represents a halogen atom, amino group, alkylthio group or arylthio group;

Formula (III)



Wherein R_9 represents an aryl group; R_{10} and R_{11} independently represent an alkyl group or cycloalkyl group, provided that the total carbon number of R_{10} and R_{11} is 9 or less; X and Y are the same as defined in Formula (I) and (II).

5,066,575

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING PYRAZOLO (1,5-B)(1,2,4)TRIAZOLE MAGENTA COUPLER

Tadahisa Sato; Osamu Takahashi; Hideaki Naruse, and Yuki Mizukawa, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1990, Ser. No. 473,166

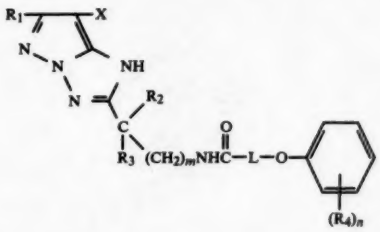
Claims priority, application Japan, Jan. 31, 1989, 1-22279

Int. Cl.[5] G03C *1/08*

U.S. Cl. 430—558 **13 Claims**

1. A silver halide color photographic material, which comprises a support having thereon at least one silver halide emulsion layer, at least one of said emulsion layers containing at least one nondiffusible pyrazolo(1,5 b)(1,2,4)triazole magenta coupler represented by the following general formula (I):

(I)



wherein R_1 represents an alkyl group; R_2 and R_3 each represents a hydrogen atom or an alkyl group, provided that both are not a hydrogen atom; R_4 represents an alkyl group, an alkoxy group or a halogen atom; L represents an alkylene group; m represents an integer of 0 to 5; n represents an integer of 0 to 5, and when n is 2 or more, the R_4's may be different from one another; and X represents a halogen atom.

5,066,576

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Seiji Ichijima; Naoki Saito; Keiji Mihayashi; Yoshio Ishii, and Akira Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 18, 1990, Ser. No. 584,116

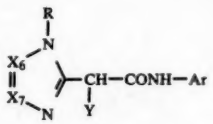
Claims priority, application Japan, Oct. 3, 1989, 1-258512; Jul. 16, 1990, 2-187798

Int. Cl.[5] G03C *7/36*

U.S. Cl. 430—558 **6 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one light sensitive silver halide emulsion layer, wherein said emulsion layer contains a coupler represented by formula (V):

(V)



wherein:

Y represents a group which is eliminated by coupling and has substantially no photographic effect,

X_6 X_7 each represent a methine group or a nitrogen atom,

R represents an alkyl group, an aryl group or a heterocyclic ring,

Ar represents an aryl group, and

X_6 and X_7 are not bonded to each other through their substituent groups to form a condensed ring.

5,066,577

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Koki Nakamura; Takayuki Ito; Masaaki Tsukase, and Toshiki Taguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 24, 1990, Ser. No. 513,736

Claims priority, application Japan, Apr. 25, 1989, 1-105424

Int. Cl.[5] G03C *5/54, 7/26*

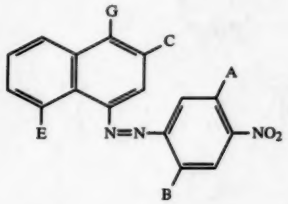
U.S. Cl. 430—562 **5 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, wherein the silver halide color photographic material contains an image forming compound represented by the following general formula (I):

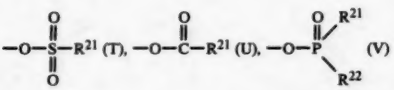
$(Dye—X)_1—y$ (I)

wherein Dye represents a cyan dye group represented by the general formula (II) described below or a precursor thereof; X represents a chemical bond or a linking group; Y represents a group having a property of releasing Dye in correspondence or counter-correspondence to development of a light-sensitive silver salt having a latent image distributed imagewise and making a difference in diffusibility between the dye thus-released and the compound represented by $(Dye—X)_1—Y$; Dye and X are connected with each other by C or E in the general formula (II); and q represents an integer of 1 or 2, and when q is 2, the two groups (Dye—X) may be the same or different:

(II)



wherein A represents a halogen atom, $—OR^1$ or $—SR^1$ (wherein R^1 represents an alkyl group, an aryl group or a heterocyclic group); B represents an electron withdrawing group having a Hammett's op value of not less than 0.3; C represents a chemical bond, a hydrogen atom, an alkyl group, a cycloalkyl group, an aryl group, a halogen atom, $—OR^4$, $—CONR^4R^5$, $—SO_2NR^4R^5$, $—N(R^3)—COR_4$ or $—N(R^3)—SO_2R_4$ (wherein R^3, R^4 and R^5 each represents a hydrogen atom or a group selected from those defined for R^1, or R^4 and R^5 may combine with each other to form a 5-membered or 6-membered ring); E represents a chemical bond, a hydrogen atom, an alkyl group, a halogen atom, $—OR^4$, $—CONR^4R^5$, $—SO_2NR^4R^5$, $—N(R^5)—COR^4$ or $—N(R^5)—SO_2R^4$ (wherein R^4 and R^5 have the same meaning as defined above); and G represents a hydroxy group or a salt thereof, or a group selected from those represented by the formula (T), (U) or (V):



wherein R^{21} and R^{22}, which may be the same or different, each represents an alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an aryl group, a heterocyclic group, an alkylthio group, an arylthio group, an alkoxy group, an aryloxy group or an amino group, or R^{21} and R^{22} may combine with each other to form a 5-membered or 6-membered ring.

5,066,578

LONG-TERM PRESERVATION OF ORGANS FOR TRANSPLANTATION

Joan Wikman-Coffelt, Davis, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Dec. 21, 1989, Ser. No. 455,562
Int. Cl.[5] A01N *1/02*
U.S. Cl. 435—1 **20 Claims**

1. An organ preservation solution suitable for long-term preservation of liver, kidney, spleen, heart-lung, pancreas, cartilage, skin and cornea for transplantation, consisting of pyruvate, inorganic salts providing ions to retain the cell action potential across the membrane and a protein selected from the group consisting of albumin and fetal calf serum.

5,066,579

HTLV-I PEPTIDE ANTIGEN AND ASSAY

Gregory R. Reyes, Palo Alto, Calif., assignor to Genelabs Incorporated, Redwood City, Calif.

Continuation of Ser. No. 948,270, Dec. 31, 1986, abandoned. This application Jun. 13, 1989, Ser. No. 366,313
Int. Cl.[5] G01N *33/569*
U.S. Cl. 435—5 **6 Claims**

1. A recombinant peptide antigen which is selected from the group consisting of peptides which have less than about 80 amino acids, derived from HTLV-I envelope protein gp46, and which contain the immunogenic region formed by the amino acid sequence Leu-Leu-Val-Asp-Ala- Pro-Gly-Tyr-Asp-Pro-Ile-Trp-Phe-Leu-Asn-Thr-Glu-Pro-Ser-Gln-Leu-Pro-Pro-Thr-Ala-Pro-Pro-Leu-Leu-Pro-His-Ser-Asn-Leu-Asp-His-Ile-Leu-Glu-Pro-Ser; and (b) immunoreactive with anti-HTLV-I antibody produced by the cell line characterized by ATCC Number HB10571.

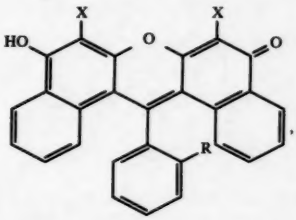
5,066,580

XANTHENE DYES THAT EMIT TO THE RED OF FLUORESCEIN

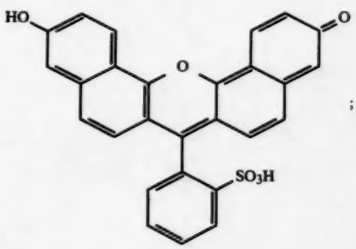
Linda Lee, Mountain View, Calif., assignor to Becton Dickinson and Company, N.J.

Division of Ser. No. 233,945, Aug. 31, 1988, Pat. No. 4,933,471. This application Feb. 16, 1990, Ser. No. 481,010
Int. Cl.[5] C12Q *1/00, 1/44, 1/02*; G01N *33/53, 33/48, 1/30, 31/00*
U.S. Cl. 435—721 **21 Claims**

1. A method for staining cells in a sample which comprises incubating said with a tagging agent which specifically binds to said cells under conditions sufficient to allow said cells to bind with said tagging agent, said tagging agent being coupled to a fluorescent compound selected from the group consisting of



wherein R is CO_2H or SO_3H, and X is H or Br when R is CO_2H and X is H when R is SO_3H;



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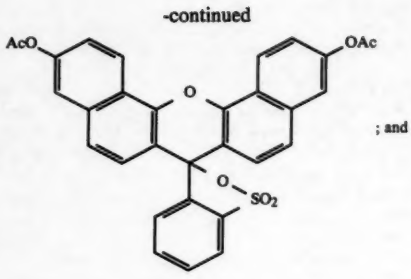
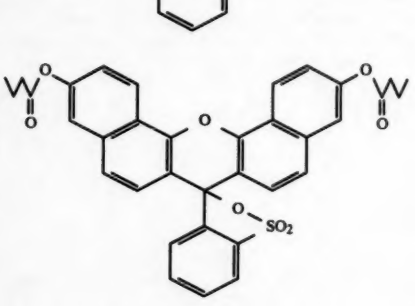


; and



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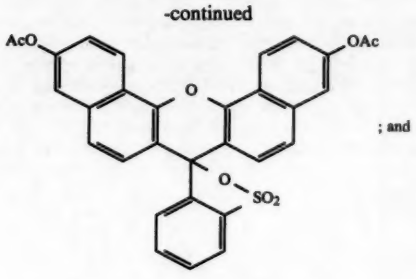
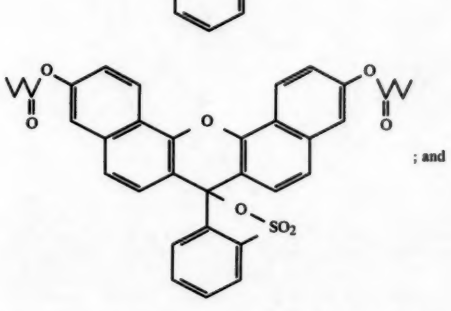


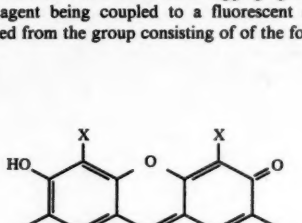
; and



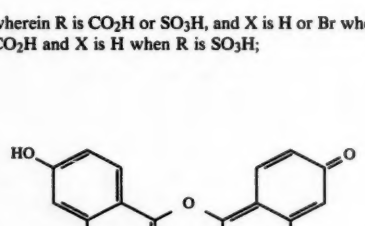
; and

8. A method for identifying cells in a sample which comprises:

(a) incubating said cells with a tagging agent which specifically binds to said cells under conditions sufficient to allow said cells to bind with said tagging agent, said tagging agent being coupled to a fluorescent compound selected from the group consisting of of the formula



wherein R is CO_2H or SO_3H, and X is H or Br when R is CO_2H and X is H when R is SO_3H;

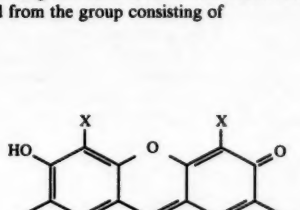


;

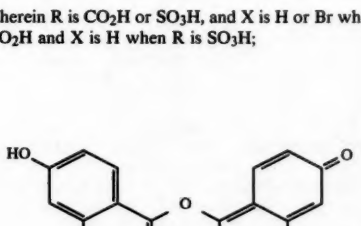
(b) detecting fluorescence emitted by said bound tagging agent as a measure of the presence of said cells.

16. A method for discriminating between live cells and dead cells in a sample which comprises:

(a) incubating said cells with a fluorescent compound selected from the group consisting of



wherein R is CO_2H or SO_3H, and X is H or Br when R is CO_2H and X is H when R is SO_3H;



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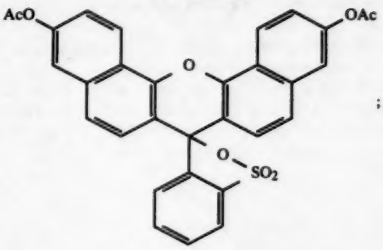

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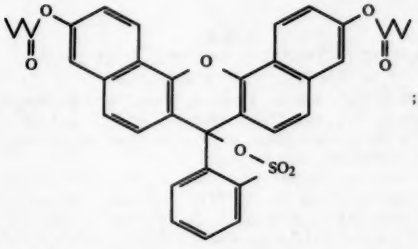


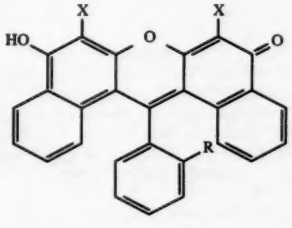
; and

under conditions sufficient to allow uptake of said compound by said live cells; and

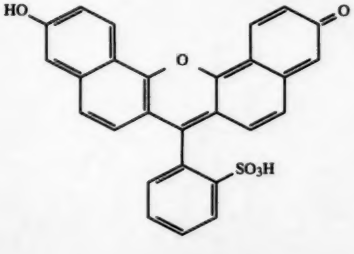
(b) detecting fluorescence emitted by said compound as a measure of the presence of said live cells.

19. A method for detecting an esterase activity in a sample of cells comprising

a) incubating said cells with a fluorescent compound selected from the group consisting of



wherein R is CO_2H or SO_3H, and X is H or Br when R is CO_2H and X is H when R is SO_3H;



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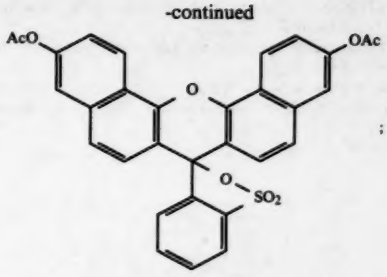

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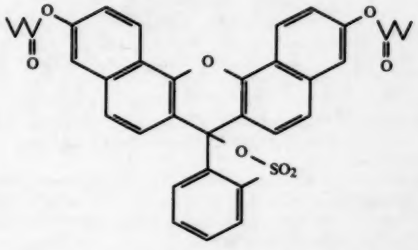


under conditions sufficient to allow uptake of said compound by said cells and cleavage of said compound by said esterase activity

b) detecting fluorescence emitted by said cleaved compound as a measure of said esterase activity.

5,066,581

DIFFERENTIATION ANTIGEN, NDA_3, ASSOCIATED WITH THE RECEPTOR FOR B CELL GROWTH FACTOR

Nicole Suciu-Foca, Cliffside Park, N.J., and Donald W. King, Chicago, Ill., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Feb. 5, 1987, Ser. No. 11,004

Int. Cl.[5] C07K *15/06, 15/28;* **G01N** *33/567, 33/577*

U.S. Cl. 435—7.24 **11 Claims**

1. A purified differentiation antigen (NDA_3) associated with the growth and proliferation of activated B lymphocytes and having a molecular weight of about 36,000 daltons which comprises at least a portion of B cell growth factor receptor specific for BCGF-12 kd and which is present on activated B cells and helper T cells and is immunologically reactive with the monoclonal antibody designated MoAb NDA_3 produced by hybridoma ATCC Accession No. HB 9334.

5,066,582

METHOD AND APPARATUS FOR THE MEASUREMENT OF ANALYTE SUBSTANCES

Hitoshi Tsuruta; Hideaki Yamada, both of Kurashiki, and Michihiro Nakamura, Soja, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Feb. 17, 1989, Ser. No. 311,779

Claims priority, application Japan, Feb. 19, 1988, 63-38274

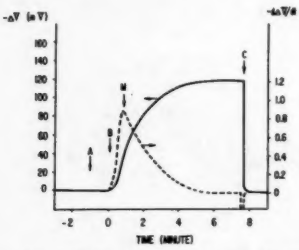
Int. Cl.[5] G01N *33/543*

U.S. Cl. 435—7.1 **6 Claims**

4. An apparatus for measuring the amount of an analyte substance present in a sample by contacting the product of a completed analyte-receptor reaction bound to a solid phase with a solution containing a substrate capable o changing the pH of said substrate solution upon its reaction with said product, wherein change in the pH of said substrate is used to measure the amount of analyte in the sample, said apparatus comprising:

a) a cell means having an inlet means and an outlet means for said substrate solution;

b) a pH electrode having a pH sensitive surface housed in said cell means;
c) a pump means for supplying said substrate solution into said cell means;
d) a solid phase in said cell means comprising a small-diameter tube having an inner diameter of not more than 2.0



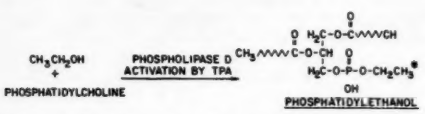
mm, said small-diameter tube having fixed on its inner wall a first receptor which can specifically bind said analyte; and
e) a means for positioning said solid phase in a non-touching spaced relationship with the facing the pH sensitive surface of said pH electrode such that the distance between the two is not more than 1 mm.

5,066,583

METHOD FOR DISTINGUISHING ALCOHOLICS FROM NON-ALCOHOLICS

Gerald C. Mueller, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 21, 1988, Ser. No. 287,821
Int. Cl.[5] C12Q *1/02, 1/34, 1/44*
U.S. Cl. 435—18 **4 Claims**



1. A method of determining if a person is alcohol dependent, which method comprises:
(a) determining under optimum conditions the ability of the lymphocytes of the person to synthesize phosphatidylethanol; and
(b) comparing the results obtained against a standard determined under identical conditions employing the lymphocytes of persons known not to be alcohol dependent, whereby a phosphatidylethanol level higher than the standard indicates the person may be alcohol dependent.

5,066,584

METHODS FOR GENERATING SINGLE STRANDED DNA BY THE POLYMERASE CHAIN REACTION

Ulf B. Gyllensten, Berkeley, and Henry A. Erlich, Oakland, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Sep. 23, 1988, Ser. No. 248,896
Int. Cl.[5] C12P *19/34*
U.S. Cl. 435—91 **7 Claims**

1. A method for generating single stranded DNA by the polymerase chain reaction, said method comprising:
(a) treating a nucleic acid with deoxyribonucleoside-5'-triphosphates, an agent for polymerization, and first and second oligonucleotide primers under hybridizing conditions such that an extension product of said first primer is synthesized that is complementary to a nucleotide sequence in said nucleic acid, wherein the extension product of said first primer can serve as a template for synthesis of an extension product of said second primer and the first primer is present in excess of the second primer;
(b) denaturing the extension products of said primers formed in step (a) from the templates on which they were synthesized;
(c) treating the products of step (b) with the primers and under the conditions of step (a); and
(d) repeating steps (b) and (c) until said second primer is present in a limiting concentration so that the extension product of the first primer accumulates in excess of the extension product of the second primer.

5,066,585

METHOD OF INHIBITING FUNGUS USING NOVEL ANTIFUNGAL COMPOUNDS

Alan R. Putnam, Gallatin Gateway, Mont.; Saroj K. Mishra, Houston, Tex., and Muraleedharan G. Nair, East Lansing, Mich., assignors to Board of Trustees Operating Michigan State University, East Lansing, Mich.

Division of Ser. No. 550,070, Jul. 9, 1990, which is a continuation-in-part of Ser. No. 311,299, Feb. 16, 1989, Pat. No. 4,977,084. This application Nov. 23, 1990, Ser. No. 617,219
Int. Cl.[5] A61K *31/90;* **C12R** *1/29;* **C12P** *19/56*
U.S. Cl. 424—121 **6 Claims**

1. A method of inhibiting a fungus which comprises:
contacting the fungus with an effective amount of an antifungal compound produced from mycelium of *Micromonospora spartanea* ATCC 53803, wherein the compound is selected from the group consisting of $C_{42}H_{53}O_{16}N$ with a molecular weight of 827 and $C_{42}H_{53}O_{16}N$ with a molecular weight of 827 and mixtures thereof.

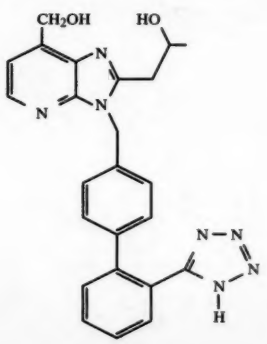
5,066,586

PROCESS FOR PREPARATION OF NOVEL ANGIOTENSIN II ANTAGONISTS

Shieh-Shung T. Chen, Morganville, and George Doss, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

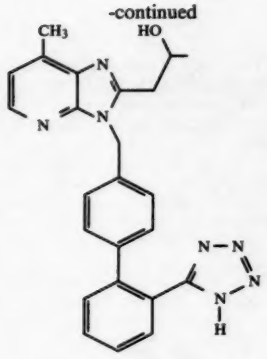
Filed Aug. 20, 1990, Ser. No. 569,895
Int. Cl.[5] C12P *17/18*
U.S. Cl. 435—119 **4 Claims**

1. A process for the preparation of compounds represented by formula I, II, III and IV

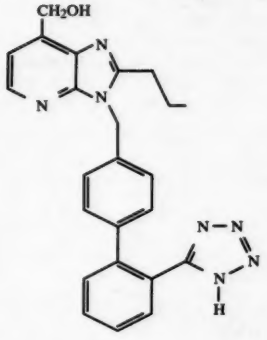


I

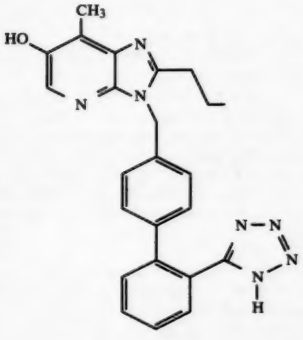
-continued



II

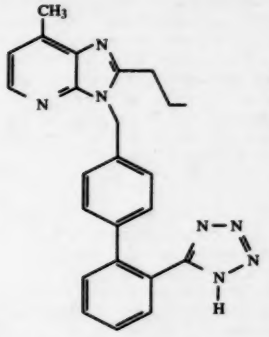


III



IV

which comprises the steps of: 1) culturing the microorganism Streptomyces sp. (MA 6744) (ATCC 55041) in a nutrient medium in the presence of a substrate compound V



V

under aerobic conditions at pH 6.0–8.0 and a temperature of 26°–29° C. until a substantial amount of the compounds are produced; and 2) isolating and purifying the compounds so produced; wherein: the nutrient medium comprises an assimilable carbon source in the form of carbohydrates, an assimilable nitrogen source and mineral salts; and the substrate compound V is present at a concentration of 0.05 to 0.2 mg/ml.

5,066,587

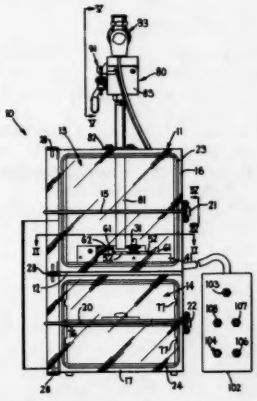
GAS DRIVEN MICROPROJECTILE ACCELERATOR AND METHOD OF USE

Lawrence D. Jones, Portage; Paul T. Frey, Delton; David D. Gleason, Oshtemo Township, Kalamazoo County; Paula P. Chee, and Jerry L. Slightom, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 26, 1990, Ser. No. 471,216

Int. Cl.[5] C12N *15/89*; C12M *1/00*

U.S. Cl. 435—172.1 **7 Claims**



7. A method of injecting a foreign substance into a sample of plant cells or tissue utilizing a sample chamber for holding the sample, an injection chamber containing a movable transport member having a series of spaced-apart stopper plugs mounted thereon and movable therewith through a series of positions, a macroprojectile gun for directing a macroprojectile at one of said stopper plugs at one of said positions, passage means extending from said one stopper plug into said sample chamber, which method comprises:

maintaining a vacuum in both of said sample chamber and said injection chamber;

firing said macroprojectile gun to accelerate a macroprojec-

tile carrying microprojectiles coated with said substance to said one stopper plug at said one position so that said macroprojectile abuts against and is sealed with respect to said stopper plug and said microprojectiles move at a high speed through said passage means and then bombard said sample chamber whereby said substance becomes lodged in the interior of the sample and when said macroprojectile seals against said one stopper plug, said passage means is closed after the microprojectiles have flowed therethrough into said sample chamber;

reloading said macroprojectile gun with another macroprojectile;

maintaining said injection chamber under vacuum;

while said injection chamber is under vacuum, shifting said transport member to bring a different one of said stopper plugs into said one position;

firing said macroprojectile gun again to bombard the sample with another quantity of microprojectiles that are coated with said substance;

continuously maintaining said sample chamber under a substantially constant vacuum during said firing steps; and

isolating said sample chamber from said injection chamber except during the flow of microprojectiles into said sample chamber.

5,066,588

STREPTOCOCCUS LACTIS CONTAINING PLASMIDS ENCODING FOR MUCOIDNESS AND METHOD FOR IDENTIFYING SUCH STRAINS

Ebenezer R. Vedamuthu, Bradenton, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Continuation-in-part of Ser. No. 786,631, Oct. 11, 1985, Pat. No. 4,918,014. This application May 2, 1988, Ser. No. 189,388

Int. Cl.[5] C12N *1/21, 15/10*

U.S. Cl. 435—172.3 **11 Claims**

1. *Streptococcus lactis* containing two plasmids derived form a single plasmid in *Streptococcus cremoris* NRRL-B-15995 as a result of conjugal transfer to the *Streptococcus lactis* which plasmids contain genes which are necessary to encode for mucoidness.

5,066,589

STREPTOKINASE-CODING RECOMBINANT VECTORS

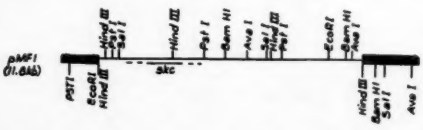
Joseph J. Ferretti, and Horst Malke, both of Oklahoma City, Okla., assignors to Board of Regents of the University of Okla., Norman, Okla.

Continuation of Ser. No. 585,417, Mar. 2, 1984. This application Jun. 27, 1988, Ser. No. 212,254

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[5] C12N *15/00, 9/70, 1/20;* **C07H** *15/12*

U.S. Cl. 435—172.3 **32 Claims**



8. A process for preparing a recombinant vector comprising a vector into which a polydeoxyribonucleotide fragment which codes for the amino acid sequence of streptokinase has been inserted, comprising:

digesting a vector with a restriction endonuclease to produce linear vector DNA; and

ligating the linear vector DNA with a polydeoxyribonucleotide fragment which codes for the amino acid sequence of streptokinase, to produce a recombinant vector comprising a vector into which a polydeoxyribonucleotide fragment which codes for the amino acid sequence of streptokinase has been inserted; and

recovering the recombinant vector.

5,066,590

SUPEROXIDE DISMUTASE COMBINED WITH A POLY(ALKYLENE OXIDE)

Akira Yabuki, and Yuji Iwashita, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 854,792, Apr. 23, 1986, abandoned. This application Feb. 2, 1989, Ser. No. 304,914

Claims priority, application Japan, Apr. 26, 1985, 60-90605

Int. Cl.[5] C12N *11/08, 9/02;* **A61K** *37/50*

U.S. Cl. 435—180 **11 Claims**

1. A modified superoxide dismutase having a molecular structure in which both ends of a poly(alkylene oxide) molecule are attached to superoxide dismutase.

5,066,591

POLYPEPTIDES OF HUMAN COPPER/ZINC SUPEROXIDE DIMUTASE

Robert A. Hallewell, San Francisco, and Guy T. Mullenbach, Oakland, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 931,920, Nov. 14, 1986, which is a continuation of Ser. No. 609,412, May 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 538,607, Oct. 3, 1983, abandoned. This application Nov. 16, 1987, Ser. No. 121,212

Int. Cl.[5] C12N *9/02, 15/03*

U.S. Cl. 435—189 **2 Claims**

1. A nonacetylated enzymatically active polypeptide comprising human copper/zinc superoxide dismutase.

5,066,592

TRIGRAMIN - A PLATELET AGGREGATION INHIBITING POLYPEPTIDE

Tur-Fu Huang, Taipei, Taiwan; Stefan Niewiarowski, Narberth; John C. Holt, Philadelphia, both of Pa., and Hanna Lukasiewicz, Warsaw, Poland, assignors to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Continuation of Ser. No. 165,661, Mar. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 121,972, Nov. 18, 1987, abandoned. This application Sep. 19, 1990, Ser. No. 584,820

Int. Cl.[5] C12N *5/08;* **A61K** *37/02;* **C07K** *7/10, 15/08*

U.S. Cl. 435—240.2 **5 Claims**

1. The polypeptide in substantially pure chemical form having the following amino acid sequence:

EAGEDCDCGSPANPCCDAATCKLIPGAQC-GEGLCCDQCSFIEEGTVCRIARGDDLDDYCNG-RSAGCPRNPFH.

5,066,593

SYNTHETIC PEPTIDE-BASED ANTI-RABIES COMPOSITIONS AND METHODS

James W. Patrick, Solana Beach; Stephen F. Heinemann, La Jolla; Barbara D. Boss, San Diego, and W. Maxwell Cowan, Cardiff by the Sea, all of Calif., assignors to The Salk Insstitute for Biological Studies, San Diego, Calif.

Division of Ser. No. 941,163, Dec. 12, 1986, Pat. No. 4,707,356, which is a division of Ser. No. 752,222, Jul. 3, 1985, Pat. No. 4,652,629. This application Aug. 31, 1987, Ser. No. 91,509

Int. Cl.[5] C12N *5/00;* **A61K** *35/14*

U.S. Cl. 435—240.27 **9 Claims**

1. A composition comprising one or more antibodies, each of the antibodies in the composition being capable of (i) binding to a peptide with the sequence

$$(Y)_kA_{-1}CDIFTA_6SRGKRASA_{14}G(Y)_m,$$

wherein k is 0 or 1 and m is 0 or 1 but not both k and m are 1; wherein A_{-1} is S or P, A_6 is N or T, and A_{14} is N or K, and (ii) binding to rabies virus or rabies virus coat glycoprotein.

5,066,594

METHOD FOR THE MANIPULATION OF POLLEN IN PLANTS

Lorin R. DeBonte, Delran, N.J., and Willie H. T. Loh, Philadelphia, Pa., assignors to DNA Plant Technology, Cinnaminson, N.J.

Filed May 9, 1989, Ser. No. 349,570
Int. Cl.[5] C12N *5/02, 5/04*
U.S. Cl. 435—240.4 41 Claims

1. A method for stabilizing a germinated pollen grain from a flowering plant which comprises treating a pollen grain bearing a growing pollen tube with an aqueous stabilization medium comprising amounts of polyethylene glycol, a salt, and an osmoticum effective in combination to suspend further growth of the pollen tube for a time up to about 2 hours sufficient to manipulate the pollen grain, after which time, upon removal of the pollen grain from the stabilization medium, the growth of the pollen tube can be resumed.

5,066,595

PROCESS FOR INCREASING FREE POOL LYSINE CONTENT IN MAIZE

Ernest T. Hubbard, Sunnyvale; Michele D. Hollingsworth, Santa Cruz; N. V. Raghava Ram, Cupertino, all of Calif., and Judith P. Cook, Madison, Wis., assignors to Sungene Technologies Corporation, Palo Alto, Calif.

Continuation of Ser. No. 939,005, Dec. 8, 1986, abandoned. This application Nov. 7, 1989, Ser. No. 433,414
Int. Cl.[5] C12N *5/00*
U.S. Cl. 435—240.45 54 Claims

1. A process for increasing free pool lysine content of maize seed to at least 500 μg per gram dry seed weight, or increasing an average free pool lysine content of seeds produced by a maize plant to at least 325 μg per gram dry seed weight, said process comprising:

(a) culturing immature embryo obtained from a maize plant on a callus induction medium comprising mineral salts, vitamins, sucrose and an auxin as a hormone to form callus;

(b) subculturing the callus on a selection medium comprising mineral salts, vitamins, sucrose, S-2-aminoethyl-L-cysteine and an auxin as a hormone to produce callus resistant to S-2-aminoethyl-L-cysteine; and

(c) subculturing the resistant callus on regeneration medium comprising mineral salts, vitamins and sucrose to regenerate plants.

5,066,596

BACTERIAL STRAINS HARBORING CLONED GENES CONTROLLING *VIBRIO CHOLERAE* O-ANTIGEN BIOSYNTHESIS

Paul A. Manning, Flagstaff Hill; Peter R. Reeves, Hawthorndene, and Derrick Rowley, Beaumont, all of Australia, assignors to Enterovax Limited, North Adelaide, Australia

Continuation-in-part of Ser. No. 782,720, Sep. 30, 1985, abandoned. This application Jul. 31, 1987, Ser. No. 80,362
Claims priority, application Australia, Feb. 1, 1984, PG3423; Nov. 2, 1984, PG7958; PCT Int'l Appl., Jan. 31, 1985, PCT/AU85/00015
Int. Cl.[5] C12N *1/21, 15/09, 15/31, 15/63;* A61K *39/02*
U.S. Cl. 435—252.33 16 Claims

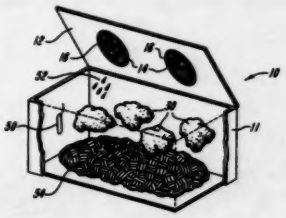
1. An avirulent strain of *E. coli* comprising DNA encoding proteins which control the synthesis of the O-antigen, which DNA is derived from a *Vibrio cholerae* strain of the Inaba or Ogawa serotype, and is at least 16 kb in length.

5,066,597

APPARATUS FOR INFECTIOUS RADIOACTIVE WASTE

Margaret C. Stinson, N. Billerica, and Mitchell S. Galanek, Plymouth, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 10, 1989, Ser. No. 335,836
Int. Cl.[5] C12M *1/12*
U.S. Cl. 435—311 9 Claims



1. An apparatus for housing solid, radioactively and biologically contaminated waste during steam autoclave treatment thereof, comprising:

a container means for housing solid radioactive biological wastes, suitable for use during an autoclaving procedure, having at least one opening therein;

a filter means for entrapping radioactive compounds contained in gases exiting said container means during autoclave treatment, said filter means being securely disposed within an opening of the container means such that any gas exiting the container means during autoclave treatment passes through the filter means; and

indicator means for establishing that the biologically contaminated waste has been inactivated by exposure to a predetermined autoclaving temperature.

5,066,598

METHOD OF CHARACTERIZING THE EFFECTIVENESS OF BASEOIL ADDITIVES

Ghazi B. Dickakian, Houston, Tex., assignor to Exxon Chemical Patents, Inc., Linden, N.J.

Division of Ser. No. 876,460, Jun. 20, 1986, Pat. No. 4,897,176. This application Oct. 23, 1989, Ser. No. 425,421
Int. Cl.[5] G01N *5/04, 30/00, 33/26*
U.S. Cl. 436—2 19 Claims

1. A process for measuring the effectiveness of an additive for reducing the onset and/or progression of asphaltene formation in a baseoil, said process comprising:

(a) measuring the amount of volatile fractions and low boiling fractions present in said baseoil to determine, in the absence of said additive, the onset and/or progression of asphaltene formation in said baseoil;

(b) incorporating said additive into a sample of said baseoil, and characterizing the coking tendency of said sample by the steps of:

I. subjecting said sample to conditions which accelerate asphaltene formation in said baseoil; and

II. testing for the onset and/or progression of asphaltene formation in said sample as a function of time; and

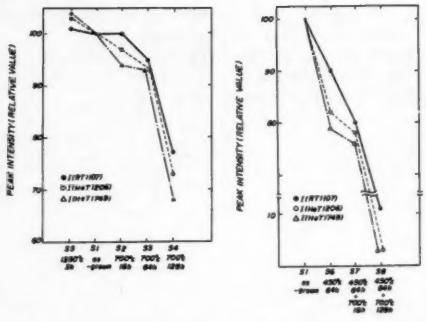
(c) comparing the onset and/or progression of asphaltene formation in steps (a) and (b).

5,066,599

SILICON CRYSTAL OXYGEN EVALUATION METHOD USING FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR) AND SEMICONDUCTOR DEVICE FABRICATION METHOD USING THE SAME

Hiroshi Kaneta, Kawasaki, and Shuichi Muraishi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki and Jeol, Ltd., Tokyo, both of, Japan

Filed Jul. 23, 1990, Ser. No. 555,702
Claims priority, application Japan, Jul. 27, 1989, 1-194700
Int. Cl.[5] H01L *21/00*
U.S. Cl. 437—7 **25 Claims**



1. A silicon crystal evaluation method comprising the steps of:

a) maintaining, at room temperature, a plurality of silicon crystals, each of said silicon crystals containing oxygen impurities, said silicon crystals including a silicon crystal having an unknown thermal history and reference silicon crystals having respective known thermal histories;

b) determining an intensity of an oxygen impurity infrared absorption peak of each of said plurality of silicon crystals at a wavenumber of $1107 \pm 3\ cm^{-1}$;

c) decreasing said temperature of said plurality of silicon crystals equal to or lower than 10K;

d) determining an intensity of an oxygen impurity infrared absorption peak of each of said silicon crystals at a predetermined wavenumber;

e) determining a first peak intensity ratio between the intensity of the oxygen impurity infrared absorption peak of each of said silicon crystals at $1107 \pm cm^{-1}$ and the intensity of the oxygen impurity infrared absorption peak of each of said silicon crystals at said predetermined wavenumber;

f) increasing said temperature of said plurality of silicon crystals to change said oxygen impurities to isolated point lattice defects;

g) determining an intensity of an oxygen impurity infrared absorption peak of each of said silicon crystals at said isolated point lattice defects;

h) determining a second peak intensity ratio between the intensity of the oxygen impurity infrared absorption peaks of each of said silicon crystals at room temperature and the intensity of oxygen impurity infrared absorption peak of each of said silicon crystals at said isolated point lattice defects;

i) obtaining a first difference between said first peak intensity ratio of said silicon crystal and a corresponding, second peak intensity ratio obtained when all oxygen impurities of said silicon crystal are isolated point lattice defects;

j) obtaining a second difference between said first peak intensity ratio of each of said reference silicon crystals and said second peak intensity ratio of each of said reference silicon crystals obtained when all oxygen impurities are isolated point lattice defects; and

k) determining the unknown thermal history of said silicon crystal from reference data which defines a relationship between said second difference and said known thermal histories.

5,066,600

MULTIPLE WASTE ISOLATION SYSTEM

John M. Antonevich, Jamestown, and John E. Sundeen, Lakewood, both of N.Y., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 19, 1989, Ser. No. 354,018
Int. Cl.[5] G01N *35/08*
U.S. Cl. 436—52 **8 Claims**

1. A method of isolating discharged waste from a testing device comprising the steps of:

a. providing a common drain means connected at a first end to said testing device, a plurality of drainage means connected to a second end of said common drain means for draining fluid passing through said common drain means, a purging means connected to said second end of said common drain means for purging said common drain means and valve means; and

b. selectively positioning said valve means to direct the flow of fluid through one of said drainage means and said purging means.

5,066,601

CANCER SCREENING METHOD UTILIZING A MODIFIED MILLON'S REAGENT

Jung M. Kweon, Seoul, Rep. of Korea, assignor to Sam Il Pharmaceutical Manufacturing Co., Ltd., Rep. of Korea

Continuation of Ser. No. 316,190, Feb. 27, 1989, abandoned. This application Aug. 16, 1990, Ser. No. 569,214
Int. Cl.[5] G01N *33/48*
U.S. Cl. 436—64 **10 Claims**

1. A method for determining the presence or absence of phenolic metabolites in a urine sample of a patient in an amount greater than that present in the urine of a normal and non-cancerous patient comprising:

providing a urine sample from the patient; and

adding to the urine sample an amount of an aqueous solution comprising a water soluble mercuric salt and a water soluble mercurous salt in an amount sufficient to form a precipitate whereby the precipitate indicates the presence of phenolic metabolites in an amount greater than that present in the urine of a normal and non-cancerous patient where the precipitate includes a color and whereby the precipitate indicates the absence of phenolic metabolites in an amount greater than that present in the urine of a normal and non-cancerous patient where the precipitate is white.

5,066,602

METHOD OF MAKING SEMICONDUCTOR IC INCLUDING POLAR TRANSISTORS

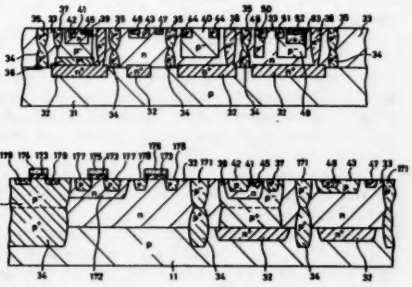
Toyoki Takemoto, Yawata; Tadao Komeda, Ikoma; Haruyasu Yamada, and Tsutomu Fujita, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 124,423, Nov. 23, 1987, Pat. No. 4,826,780, which is a division of Ser. No. 841,688, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 485,887, Apr. 18, 1983, abandoned. This application Jan. 10, 1989, Ser. No. 295,380

Claims priority, application Japan, Apr. 19, 1982, 57-65925; Jun. 2, 1982, 57-95332; Jun. 2, 1982, 57-95333; Jun. 2, 1982, 57-95334; Jun. 2, 1982, 57-95345; Sep. 9, 1982, 57-157623; Jan. 31, 1983, 58-14896

Int. Cl.[5] H01L *21/331*

U.S. Cl. 437—31 6 Claims



1. A method of fabricating a semiconductor integrated circuit, comprising the steps of:

forming a n-type semiconductor layer on a p-type semiconductor substrate, said n-type semiconductor layer being divided into first, second, third and fourth regions of n-type;

forming fifth and sixth regions of low p-type concentration in said first and second regions from upper surfaces of said first and second regions respectively;

forming seventh and eight regions of p-type in said third region from an upper surface of said third region simultaneously to said forming fifth and sixth regions step;

forming a ninth region of an n-type in said fifth region from a upper surface of said fifth region;

forming tenth, eleventh, twelfth, thirteenth and fourteenth regions of p-type in said ninth, sixth, seventh, eight and fourth regions from upper surfaces of said ninth, sixth, seventh, eighth and fourth regions respectively; and

forming fifteenth, sixteenth and seventeenth regions of n-type in said ninth, eighth and fourteenth regions from upper surfaces of said ninth, eighth and fourteenth regions respectively,

whereby a pnp type vertical bipolar transistor, resistance device, logic circuit and an npn type vertical bipolar transistor are formed in said first, second, third and fourth regions respectively.

5,066,603

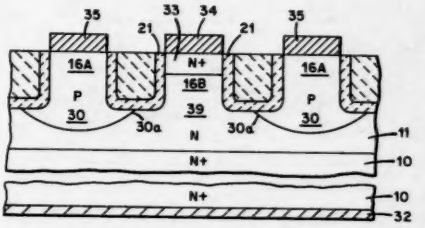
METHOD OF MANUFACTURING STATIC INDUCTION TRANSISTORS

Emel S. Bulat, Framingham, and Brian T. Devlin, Haverhill, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 6, 1989, Ser. No. 403,621

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—29 8 Claims



1. The method of fabricating a junction field effect transistor comprising

providing a body of semiconductor material including a first layer of semiconductor material of one conductivity type of relatively high resistivity and a second layer of semiconductor material of the one conductivity type of relatively low resistivity contiguous with said first layer, said first layer having a surface at a surface of the body:

forming a plurality of parallel grooves through said surface into said first layer of semiconductor material producing interposed ridges of semiconductor material, each of said grooves having side walls formed by the adjacent ridges of semiconductor material and having a bottom; alternate ridges being gate ridges and intervening ridges between the gate ridges being source ridges:

forming layers of a first nonconductive, protective material adherent to the side walls and bottoms of said grooves:

filling the remainder of said grooves with a second nonconductive protective material to produce surfaces thereof continuous with the surfaces of said ridges:

introducing conductivity type imparting material of the opposite conductivity type into the gate ridges of semiconductor material at said surfaces to convert zones of said first layer of semiconductor material to said opposite conductivity type thereby forming gate regions of the opposite conductivity type, each of said gate regions including the associated gate ridge and having portions extending laterally beneath the bottoms of the adjacent grooves toward the laterally extending portions associated with adjacent gate ridges to produce channel regions of the one conductivity type of relatively high resistivity therebetween;

introducing conductivity type imparting material of the one conductivity type into the source ridges of semiconductor material at said surfaces to produce a source region of the one conductivity type of relatively low resistivity in a zone adjacent to the surface in each of said source ridges; and

applying conductive material to form electrical contact in ohmic contact with said source and gate regions at the surfaces of said source and gate ridges, respectively.

5,066,604

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING A SELF-ALIGNED CONTACT PROCESS

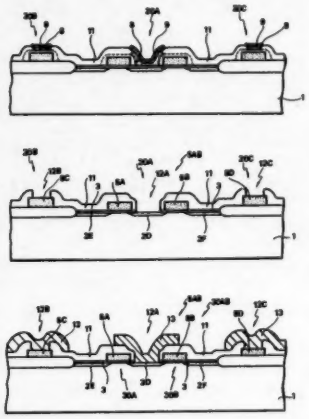
In S. Chung, Kyungki, and Dai H. Lee, Seoul, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyungki, Rep. of Korea

Filed Sep. 6, 1990, Ser. No. 578,563

Claims priority, application Rep. of Korea, Sep. 8, 1989, 89-12998

Int. Cl.[5] H01L *21/28, 21/336*

U.S. Cl. 437—44 20 Claims



12. A method for manufacturing a semiconductor device, comprising:

forming a plurality of segment separation oxide layers on a silicon substrate, with each segment separation oxide layer being spaced apart relative to one another;

depositing a gate oxide layer on the silicon substrate extending between the spaced apart segment separation oxide layers;

depositing a first conductive layer over the entire surface of the resulting structure;

removing portions of the first conducting layer to form a plurality of gate electrodes on the gate oxide layers and to form a plurality of gate electrode lines on the segment separation oxide layers, with each gate electrode being spaced apart relative to one another;

forming a plurality of lightly doped diffusion regions into portions of the silicon substrate between the spaced apart segment separation oxide layers and the gate electrodes;

depositing an spacer oxide layer on the entire surface of the resulting structure and forming from the spacer oxide layer a plurality of oxide spacers with an oxide spacer being formed on each side of each gate electrode of the plurality of gate electrodes and on each side of each gate electrode line of the plurality of gate electrode lines;

forming a plurality of diffusion regions through each lightly doped diffusion region of the plurality of lightly doped diffusion regions into the silicon substrate with each diffusion region of the plurality of diffusion regions functioning, in use, as a drain electrode or a source electrode;

forming a plurality of MOSFETs by depositing a first insulating layer on each gate electrode, each gate electrode line and each oxide spacer of the plurality of oxide spacers;

depositing an undoped polysilicon layer on the entire surface of the resulting structure;

sequentially depositing a nitride layer and a photoresist layer over the undoped polysilicon layer;

removing the photoresist layer except for those portions of the photoresist layer positioned above each gate electrode line and above each diffusion region of the plurality of diffusion regions positioned between adjacent gate electrodes of the plurality of gate electrodes to thereby define contact regions positioned over each diffusion region positioned between the gate electrodes of the MOSFETs of the plurality of MOSFETs, and over each gate electrode lines, respectively, thereby exposing the nitride layer except for those portions of the nitride layer positioned at the contact regions;

removing the nitride layer except for those portions of the nitride layer positioned at the defined contact regions, thereby exposing portions of the undoped polysilicon layer;

performing an ion-implantation process on the exposed portions of the undoped polysilicon layer to thereby form the exposed portions of the undoped polysilicon layer into a doped polysilicon layer;

removing the photoresist layer remaining above each gate electrode line and above each diffusion region of the plurality of diffusion regions positioned between adjacent gate electrodes, thereby exposing the nitride layer remaining at the contact regions;

thermally oxidizing the exposed doped polysilicon layer, thereby forming a thermal oxide layer on and into the exposed doped polysilicon layer;

sequentially removing the exposed nitride layer and the exposed underlying undoped polysilicon layer remaining at the defined contact regions to thereby expose the first insulating layer formed on each gate electrode line and to expose the gate oxide layer formed over the diffusion region positioned between the gate electrode, respectively;

forming a contact hole at each contact region by etching the thermal oxide layer, the exposed gate oxide layer positioned over the diffusion region and the first insulating layer positioned on the each gate electrode line to expose a surface of each gate electrode lines and a surface of each diffusion region positioned between gate electrodes of the plurality of gate electrodes, respectively;

depositing a second conducting layer on the entire surface of the resulting structure comprising the thermal oxide layer and the contact holes; and

removing the second conducting layer except for those portions of the second conductive layer deposited in and proximate to each contact hole such that each portion of the conducting layer forms a contact at each gate electrode lines, respectively, and a contact at each diffusion region positioned between MOSFETs of the plurality of MOSFETs, thereby enabling a selective connection to be made at each diffusion region positioned between MOSFETs of the plurality of MOSFETs and at each gate electrode line, respectively.

5,066,605

PROCESS OF PRODUCING MONOLITHICALLY INTEGRATED MULTIFUNCTION CIRCUIT ARRANGEMENTS

Erich Kasper, Pfaffenhofen; Maximilian Kuisl, Ulm; Ulf König, Ulm, and Johann F. Luy, Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,205

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813836

Int. Cl.[5] H01L *21/205*

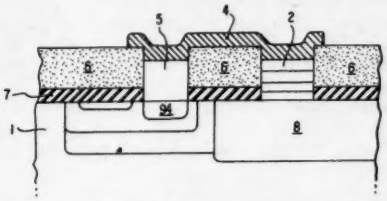
U.S. Cl. 437—51 11 Claims

1. A process for producing monolithically integrated multifunction circuit arrangements composed of at least one integrated circuit integrated in a monocrystalline semiconductor substrate and at least one multilayer semiconductor component disposed on the substrate, said method including the steps of:

providing a monocrystalline semiconductor substrate having

an integrated circuit formed therein adjacent one major surface and a passivating layer covering said one surface;

forming at least one window for a contact zone and at least one further window for a multilayered semiconductor component in said passivating layer above selected laterally separated respective connection regions of said integrated circuit extending to said one surface of said substrate,



epitaxially growing a structured semiconductor layer sequence on at least the portions of said one surface of said substrate within said windows to provide a monocrystalline multilayer component in one of said windows and a monocrystalline vertical contact zone in one of said further windows; and,

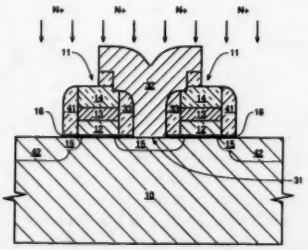
forming a conductive connection layer on top of said vertical contact zone and said multilayered component, whereby a planar, three-dimensional integrated circuit arrangement is formed.

5,066,606

IMPLANT METHOD FOR ADVANCED STACKED CAPACITORS

Ruojia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 7, 1990, Ser. No. 624,166
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **20 Claims**



1. A process for developing source/drain diffusion regions of an MOSFET during fabrication of a semiconductor on a silicon substrate, said process steps comprising:

a) depositing a first dielectric layer superjacent surface of said silicon substrate;

b) depositing a first conductive layer superjacent surface of said first dielectric;

c) depositing a second dielectric layer superjacent said first conductive layer;

d) masking and etching said first conductive and said second dielectric layers to form a first control line;

e) implanting a lightly doped impurity into said silicon substrate, thereby forming said source/drain diffusion regions on opposite sides of said control line;

f) said step of implanting a lightly doped impurity causing said control line to bridge said source/drain diffusion regions, thereby forming a gate isolated from said silicon substrate by said first dielectric layer, said gate bridging a pair of said source/drain diffusion regions to form said MOSFET;

g) depositing a third dielectric layer superjacent existing topology of surface of said semiconductor;

h) creating an aligned d buried contact location thereby providing a second control line junction at a first source/-drain diffusion region of said MOSFET;

i) depositing a second conductive layer superjacent said semiconductor surface, said second conductive layer making direct contact to said second control line junction at said buried contact location;

j) masking and etching said second conductive layer to form a conductive second control line;

k) anisotropically etching said third dielectric layer; and

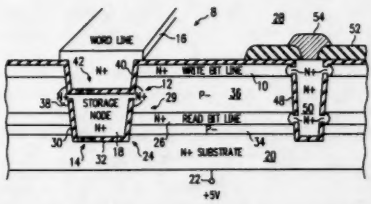
l) implanting a heavily doped impurity into said source/-drain diffusion regions of said MOSFET, said implanting taking place at regions not covered by an implant blocking remnant of said second dielectric.

5,066,607

METHOD OF MAKING A TRENCH DRAM CELL WITH DYNAMIC GAIN

Sanjay K. Banerjee, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 126,523, Nov. 30, 1987. This application Aug. 16, 1990, Ser. No. 567,989
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **13 Claims**



1. A method for forming a semiconductor DRAM cell, comprising the steps of:

forming a trench capacitor in a semiconductor substrate;

connecting a write bit line through a vertical pass transistor to said capacitor;

connecting a vertical gain transistor between a supply voltage and a read bit line;

connecting said gain transistor to said capacitor so that the conduction of said gain transistor is controlled by the voltage across said storage capacitor;

fabricating said gain transistor and said pass transistor so that said gain transistor is characterized by a faster conduction response time than said pass transistor; and

connecting a word line to said cell for controlling said pass transistor when writing said cell and for boosting the voltage across said capacitor when said cell is read to thereby control the conduction of said gain transistor.

5,066,608

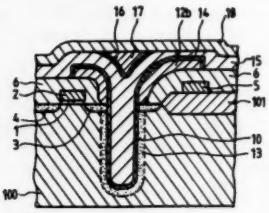
METHOD OF MAKING A DRAM CELL WITH STACKED TRENCH CAPACITOR

Seong-tae Kim; Su-han Choi, and Jae-hong Ko, all of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 16, 1990, Ser. No. 494,322
Claims priority, application Rep. of Korea, Dec. 8, 1989, 89-18187
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **12 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of:

growing a field oxide layer on a semiconductor substrate of a first conductivity type to define an active region;
forming a first insulating layer on the sample obtained after forming a gate electrode of a first conductive layer, a source region and a drain region on said active region;
forming an opening to expose a part of said source region;
forming a first electrode pattern by depositing a second polycrystalline silicon layer on said first insulating layer and the entire surface of the exposes substrate;
forming a mask by depositing a second insulating layer on said first electrode pattern;
forming a trench in said semiconductor substrate within said source region by applying said mask;



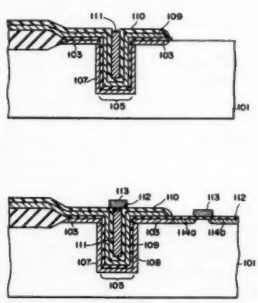
doping impurities on both said first electrode pattern and said semiconductor substrate of inside of said trench, such that said first impurity-doped electrode patterns is in direct contact with impurity-doped region formed on inside of said trench;
forming a dielectric film on both said impurity-doped first electrode pattern and said inside of said trench including said impurity-doped region;
depositing a third conductive layer, an etch blocking layer and a fourth conductive layer onto said dielectric film in turn; and
depositing a fifth conductive layer after a planarization step.

5,066,609

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING A TRENCH CAPACITOR

Tadashi Yamamoto, Kawasaki; Yusuke Kohyama, and Takeshi Tanaka, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 23, 1990, Ser. No. 469,055
Claims priority, application Japan, Jul. 25, 1988, 63-185083
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **9 Claims**



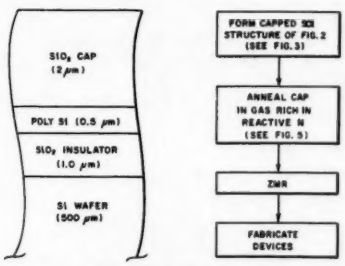
1. A method of manufacturing a semiconductor device including a trench capacitor, the method comprising the steps of:
selectively etching a semiconductor substrate to form a groove therein;
forming a conductive first layer on the sides and bottom of said groove and on said semiconductor substrate, said conductive first layer serving as a first plate electrode of said capacitor;
forming an insulating second layer on said first layer and on said semiconductor substrate, said insulating second layer serving as a dielectric of said capacitor;
forming a conductive third layer on said insulating second layer;
patterning said third layer so as to remain at a position corresponding to that of said first plate electrode, in order to form a second plate electrode of said capacitor;
forming an insulating fourth layer which covers said second plate electrode;
forming a fifth layer on said fourth layer so as to fill said groove;
etching said fifth layer so that it remains only in said groove; and
forming an insulating sixth layer on said fifth layer.

5,066,610

CAPPING TECHNIQUE FOR ZONE-MELTING RECRYSTALLIZATION OF INSULATED SEMICONDUCTOR FILMS

Chenson K. Chen, Weston, and Bor-Yeu Tsaur, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 124,346, Nov. 20, 1987, Pat. No. 4,889,585, which is a continuation of Ser. No. 805,117, Dec. 4, 1985, abandoned. This application Sep. 22, 1989, Ser. No. 410,921
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—83 **8 Claims**


SiO_2 CAP (2 μm)
POLY SI (0.5 μm)
SiO_2 INSULATOR (1.0 μm)
SI WAFER (500 μm)
FORM CAPPED SOI STRUCTURE OF FIG. 2 (SEE FIG. 3)
ANNEAL CAP IN GAS RICH IN REACTIVE N (SEE FIG. 5)
ZMR
FABRICATE DEVICES

1. A method of forming an encapsulated insulated semiconductor film structure, comprising
forming an insulating layer on a substrate,
forming a semiconductor layer of amorphous or polycrystalline silicon on top of said insulating layer to form a silicon on insulator structure,
providing an atmosphere consisting essentially of inerts and a noninert gas, stable at ambient temperature, which is a source of a reactive material whose presence promotes wetting of molten silicon on silicon dioxide, said noninert gas decomposing below the melting point of silicon to release said reactive material,
annealing said structure in said atmosphere at a temperature below the melting point of silicon but high enough to decompose said gas so as to release said reactive material to deliver sufficient quantities of said reactive material to the surface of said structure to avoid agglomeration of the resulting semiconductor film,
forming a capping layer of silicon dioxide covering a substantial portion of said semiconductor layer, said reactive material being present at the interface, and
subjecting the annealed structure of the preceding steps to zone-melting recrystallization.

5,066,611

METHOD FOR IMPROVING STEP COVERAGE OF A METALLIZATION LAYER ON AN INTEGRATED CIRCUIT BY USE OF MOLYBDENUM AS AN ANTI-REFLECTIVE COATING

Chang Yu, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Aug. 31, 1990, Ser. No. 575,942
Int. Cl.[5] H01L *21/26*
U.S. Cl. 437—173 **6 Claims**

1. A method for improving step coverage of a metallization layer comprising an aluminum alloy or other low boiling point or high optical reflectivity metal on an integrated circuit during production of micron/submicron geometry contacts, surface recesses, and/or contact vias, comprising the following sequential steps:

depositing a layer of electrically conductive metal over an integrated circuit assembly;

depositing a layer of molybdenum over the conductive metal; and subjecting the resulting laminate to laser planarization at a fluence level sufficient to melt the underlying conductive metal while using the layer of molybdenum as an anti-reflective coating, thereby widening the planarization process window by the resulting increase in efficient use of laser energy by absorption of such energy into the underlying conductive metal to melt the conductive metal and a lowering of the via-fill limit, attributable to a combination of the reflective properties of molybdenum, as well as its resistance to oxidation, thermal conductivity and specific heat, without a proportional lowering of the ablation limit, which is attributable to the evaporation temperature of molybdenum.

5,066,612

METHOD OF FORMING WIRING OF A SEMICONDUCTOR DEVICE

Takayuki Ohba, Yokohama; Shinji Miyagaki, Tokyo; Tatsushi Hara, Inagi; Kenji Morishita, Yokohama; Seiichi Suzuki, Kawasaki, and Seigen Ri, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 3, 1991, Ser. No. 637,152
Claims priority, application Japan, Jan. 5, 1990, 2-277; Feb. 20, 1990, 2-38826
Int. Cl.[5] H01L *21/44, 21/48*
U.S. Cl. 437—192 **16 Claims**

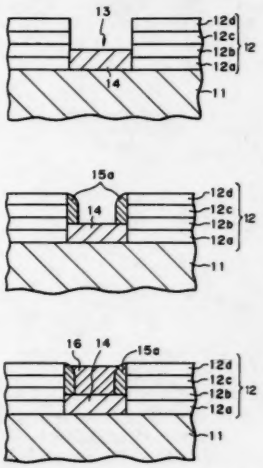
1. A method of forming wiring of a semiconductor device, comprising the following steps (a) to (f):

(a) forming a multilayer insulating layer (**12**) comprising at least an insulating layer (**12*c***) activating a metal selective vapor-growth and a top insulating layer (**12*d***) preventing a metal selective-growth on a semiconductor substrate (**1**);

(b) forming a contact-hole (**13**) reaching said semiconductor substrate (**1**) by selectively etching said multilayer insulating layer (**12**);

(c) growing a first metal layer (**14**) having a thickness such that a surface of the layer (**14**) is lower than the level of said insulating layer (**12*c***) preventing a metal selective vapor-growth in said contact-hole (**13**) by a selective vapor-growing method;

(d) forming an insulator side film (**15*a***) on the side wall of said contact-hole (**13**) by depositing an insulator film (**15**) preventing a metal selective vapor-growth over a whole surface of the inside surface of said contact-hole (**13**) and said top insulating layer (**12*d***) and by anisotropically etching the film (**15**) to expose the surface of said first metal layer (**14**);



(e) filling said contact-hole (**13**) with a second metal layer (**16**) by depositing said second metal layer (**16**) on said first metal layer and within said contact-hole by a selective vapor-growing method; and

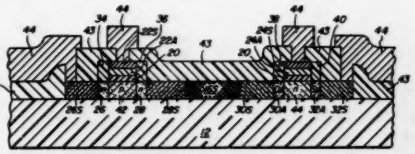
(f) forming a conductor line layer (**17**) on said second metal layer (**16**) and said top insulating layer (**12*d***).

5,066,613

PROCESS FOR MAKING SEMICONDUCTOR-ON-INSULATOR DEVICE INTERCONNECTS

Ronald E. Reedy; Graham A. Garcia, and Isaac Lagnado, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 13, 1989, Ser. No. 380,175
Int. Cl.[5] H01L *21/283*
U.S. Cl. 437—200 **12 Claims**



1. A process for developing conductive interconnects between integrated circuit semiconductor devices formed on an insulating substrate comprising:

forming a patterned layer of semiconductor material directly on the surface of said insulating substrate, said semiconductor material having a surface and also having an interface with said insulating substrate, said patterned layer comprising a first set of regions where at least one semi-

conductor device will be formed and a second set of regions where electrical interconnects to said at least one semiconductor device will be formed, said second set of regions extending through the entire region between said surface and said interface;

forming said at least one semiconductor device;

converting said second set of regions to a metallic compound of said semiconductor material; and further wherein:

said at least one semiconductor device has at least two terminals comprised of said semiconductor material; and where at least a portion of at least one of said terminals is converted to said metallic compound of said semiconductor material substantially simultaneously with said conversion of said second set of regions.

5,066,614

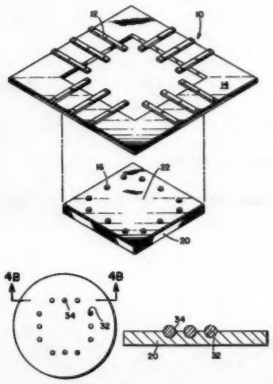
METHOD OF MANUFACTURING A LEADFRAME HAVING CONDUCTIVE ELEMENTS PREFORMED WITH SOLDER BUMPS

Thomas J. Dunaway, St. Louis Park; Richard K. Spielberger, Maple Grove; Lori A. Dicks, New Hope, and Jerald M. Loy, Anoka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 274,412, Nov. 21, 1988. This application Sep. 28, 1990, Ser. No. 589,816

Int. Cl.[5] H01L *21/60*

U.S. Cl. 437—209 **9 Claims**



1. A method of manufacturing a bond-when-ready bumped leadframe comprising the steps of:

a) providing a leadframe comprising at least one of power, ground, and signal conductive elements; and

b) preforming solder bumps onto the conductive elements to provide means for selectively bonding the conductive elements to bonding locations of an electronic device, the solder bumps being preformed with a composition for maintaining a single solid phase over the temperature range of 0° C. to 150° C.

5,066,615

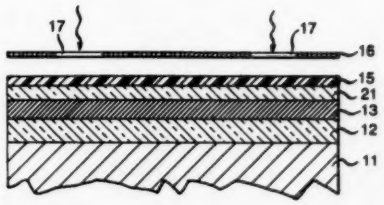
PHOTOLITHOGRAPHIC PROCESSES USING THIN COATINGS OF REFRACTORY METAL SILICON NITRIDES AS ANTIREFLECTION LAYERS

Michael F. Brady, Morrisville; John K. Dorey, II, Fairless Hills, both of Pa., and Aubrey L. Helms, Jr., Sunnyvale, Calif., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 425,134, Oct. 23, 1989. This application Aug. 6, 1990, Ser. No. 562,874

Int. Cl.[5] H01L *21/00, 21/02, 21/88*

U.S. Cl. 437—229 **21 Claims**



1. A photolithographic method for making a pattern over a reflective surface comprising the steps of: covering a reflective surface of a substrate with an antireflection coating; covering the antireflection coating with a radiation-sensitive material; selectively exposing the radiation-sensitive material to electromagnetic radiation by directing electromagnetic radiation through a patterned mask onto selected regions of the radiation-sensitive material to form a pattern; selectively removing the radiation-sensitive material in accordance with said pattern, thereby to form a patterned mask, characterized in that:

the antireflection coating is a composition containing x-silicon-nitride, where x is a metal taken from the group consisting of titanium, vanadium, chromium, zirconium, niobium, molybdenum, hafnium, tantalum and tungsten.

5,066,616

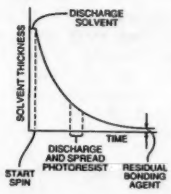
METHOD FOR IMPROVING PHOTORESIST ON WAFERS BY APPLYING FLUID LAYER OF LIQUID SOLVENT

William G. Gordon, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 365,870, Jun. 14, 1989, abandoned. This application Sep. 7, 1990, Ser. No. 581,248

Int. Cl.[5] H01L *21/00, 21/02, 21/30;* **B05D** *1/40*

U.S. Cl. 437—229 **20 Claims**



1. In an integrated circuit fabrication process, a method for uniformly applying photoresist to a top surface of a wafer, the method comprising:

spreading a liquid solvent substantially uniformly over the wafer surface to form a liquid solvent film;

applying a liquid photoresist to the wafer surface; and

spreading the photoresist over the solvent film while a thickness of at least 100 Angstroms of liquid solvent remains on the entire wafer surface to wet the wafer surface with a mobile layer of fluid solvent such that the photoresist is

distributed in a substantially uniform layer over the entire surface of the wafer.

5,066,617

METHOD FOR PRODUCING PLZT POWDER

Kei Tanemoto; Akiro Ando, and Hiroshi Kubo, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 74,064, Jul. 16, 1987, abandoned. This application May 8, 1989, Ser. No. 351,277

Claims priority, application Japan, Jul. 23, 1986, 61-171830

Int. Cl.[5] C04B *35/49*

U.S. Cl. 501—134 **13 Claims**

13. A method for producing a PLZT ceramic comprising the steps of:

(a) preparing a first aqueous solution comprising lead based and lanthanum based components of PLZT, wherein the lead based and lanthanum based components are each independantly selected from the group consisting of metals, sulfates, nitrates, oxynitrates, acetates, chlorides, oxychlorides and oxides;

(b) preparing a second aqueous solution comprising zirconium based and titanium based components of PLZT, wherein the zirconium based and titanium based components are each independantly selected from the group consisting of metals, sulfates, nitrats, oxynitrates, acetates, chlorides, oxychlorides and oxides;

(c) forming homogeneous precipitates from said first and said second aqueous solutions by dropping the first and second aqueous solutions into a liquid body of a common precipitant, simultaneously and synchronously, while stirring the liquid body, whereby the homogeneous precipitants are formed;

(d) calcining the thus obtained homogeneous precipitates to form a calcined powder;

(e) forming a green body of said calcined powder; and

(f) sintering said green body to form a ceramic.

5,066,618

CERAMIC ARTICLES HAVING IN SITU TAILORED METALLIC COMPONENT

Robert C. Kantner; Michael A. Rocazella; Jerry G. Weinstein, all of Newark, Del., and Danny R. White, Elkton, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 269,152, Nov. 9, 1988, abandoned, which is a continuation of Ser. No. 152,518, Feb. 5, 1988, Pat. No. 4,818,734, which is a continuation-in-part of Ser. No. 908,454, Sep. 17, 1986, abandoned. This application Aug. 16, 1990, Ser. No. 568,618

Int. Cl.[5] C04B *35/00*

U.S. Cl. 501—127 **16 Claims**

1. A self-supporting ceramic composite body comprising:

(a) an interconnected ceramic matrix comprising about 60–99% by volume of a polycrystalline oxidation reaction product consisting essentially of alumina and the remainder by volume of said ceramic matrix consisting essentially of a metallic constituent contained within said interconnected ceramic matrix, said metallic constituent comprising at least one metallic phase, said at least one metallic phase comprising nonoxidized precursor metal and at least one second metal; and

(b) at least one filler material embedded by said interconnected ceramic matrix, said at least one filler material being substantially non-reactive with said precursor metal, whereby said ceramic composite body has at least one property modified by the presence of said second metal.

5,066,619

GLASS-CERAMICS, PROCESS OF PRODUCING THE GLASS-CERAMICS AND DENTAL CROWN USING THE GLASS-CERAMICS

Tomoko Kasuga, and Toshihiro Kasuga, both of Akishima, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Aug. 23, 1990, Ser. No. 571,209

Claims priority, application Japan, Sep. 5, 1989, 1-229803

Int. Cl.[5] C03C *10/16*

U.S. Cl. 501—3 **9 Claims**

1. A glass ceramics produced by precipitating from glass a calcium-potassium mica crystal consisting of Ca—K—Mg—Al—Si—O—F and at least one crystal selected from the group consisting of an enstatite crystal, an akermanite crystal and a diopside crystal, said glass containing components being present within the ranges as follows:

	Percent of weight
CaO	2 to 17
K_2O	0.5 to 5
MgO	20 to 35
SiO_2	30 to 50
Al_2O_3	5 to 30
Fluorine (calculated as F)	1.5 to 14.

5,066,620

CONDUCTIVE PASTE COMPOSITIONS AND CERAMIC SUBSTRATES

Kazuo Sunahara; Tsuneo Ichimatsu, and Yumiko Aoki, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 467,510, Jan. 19, 1990, Pat. No. 4,985,376. This application Jul. 27, 1990, Ser. No. 558,451

Claims priority, application Japan, Jan. 31, 1989, 1-19830

Int. Cl.[5] C03C *8/02, 8/18;* C09D *5/10;* B32B *3/00*

U.S. Cl. 501—21 **8 Claims**

1. A surface conductive paste composition to be applied to the surface of a green sheet for a ceramic substrate or to the surface of a ceramic substrate after being fired and to be then fired, the solid content of which has a composition comprising from 80 to 99.9% by weight of Au powder, from 0.1 to 20% weight of crystallized glass frit and from 0 to 19.9% by weight of non-crystallized glass frit, provided that the total of the crystallized glass frit and the non-crystallized glass frit is at most 20% by weight, and which has a lead compound powder incorporated in an amount of from 0 to 5% by weight based on the total amount of said composition.

5,066,621

SEALING GLASS COMPOSITION AND ELECTRICALLY CONDUCTIVE FORMULATION CONTAINING SAME

Masyood Akhtar, San Diego, Calif., assignor to Johnson Matthey Inc., Valley Forge, Pa.

Filed Jun. 21, 1990, Ser. No. 541,605

The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.

Int. Cl.[5] C03C *3/12;* C09D *5/00*

U.S. Cl. 501—41 **13 Claims**

1. A sealing glass composition comprising, in wt. %, 13–50% lead oxide, 20–50% vanadium oxide, 2–40% tellurium oxide, up to 40% selenium oxide, up to 20% bismuth oxide, up to 10% phosphorous oxide, up to 5% niobium oxide, up to copper oxide and up to 10% boron oxide.

5,066,622

METHOD OF PRODUCING AND MODIFYING THE PROPERTIES OF CERAMIC COMPOSITE BODIES

Terry D. Claar, Newark; Gerhard H. Schiroky, Hockessin, and Kevin P. Pochopien, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 137,397, Dec. 23, 1987, abandoned.
This application Jul. 13, 1990, Ser. No. 554,100
Int. Cl.[5] C04B *35/52*
U.S. Cl. 501—87 8 Claims

1. A method of producing a self-supporting body comprising:

selecting a parent metal;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal and contacting said body of molten parent metal with a mass comprising boron carbide and at least one additive contained within said mass and selected from the group consisting of tantalum carbide, zirconium carbide, and zirconium diboride;

maintaining said temperature for a time sufficient to permit infiltration of said molten parent metal into said mass and to permit reaction of said molten parent metal with said boron carbide to form at least one parent metal boron-containing compound; and

continuing said infiltration reaction for a time sufficient to react said boron carbide substantially completely to produce said self-supporting body comprising at least one parent metal boron-containing compound, said self-supporting body containing an amount of porosity which is less than the amount of porosity which would be contained in a self-supporting body produced by an identical method but without said at least one additive.

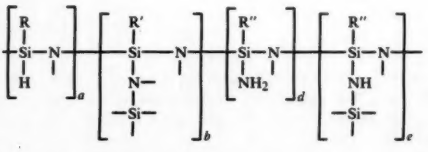
5,066,623

POLYMERIC HYDRIDOSILAZANES AND PROCESSES FOR THEIR PREPARATION, AND THEIR USE

Thomas Gerdau, Eppstein; Hans-Jerg Kleiner, Kronberg; Marcellus Peuckert; Martin Brück, both of Hofheim am Taunus, and Fritz Aldinger, Rodenbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 247,933, Sep. 22, 1988, Pat. No. 4,931,513.
This application Mar. 12, 1990, Ser. No. 491,534
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733728
Int. Cl.[5] C04B *35/56, 35/58*
U.S. Cl. 501—97 5 Claims

1. A process for the preparation of a ceramic material comprising pyrolysing a polymeric hydridosilazane of the formula



in which the free valencies of the nitrogen atoms are saturated with H atoms or silyl radicals R*SiXN< wherein X is H, Cl or N<, and in which R, R′, R″ and R* denote alkyl groups having 1 to 6 carbon atoms and a, b, d and e denote the molar fractions of the particular structural units, wherein the value of a and b ranges from 0.1 to 0.8, and the value of the sum of d+e ranges from 0.1–0.8, at 800° C. to 1,400° C., in an inert nitrogen or argon atmosphere.

5,066,624

REFRACTORY THIXOTROPIC VIBRATION COMPOUND FOR THE VIBRATION LINING OF METALLURGICAL VESSELS

Gert König, Cologne, and Jürgen Baumann, Neuss, both of Fed. Rep. of Germany, assignors to Martin & Pagenstecher GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 23, 1987, Ser. No. 41,032
Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615505
Int. Cl.[5] C04B *35/16, 35/48*
U.S. Cl. 501—107 9 Claims

1. A refractory thixotropic self-curing zirconium silicate-based vibration compound for obtaining a vibration density of at least 3.5 g/cm^3 having the following chemical composition (in % by mass):

20 to 30%	SiO_2
20 to 45%	Al_2O_3
0.7 to 1.4%	TiO_2
0.2 to 0.8%	P_2O_5
0 to 1.5%	$K_2O + Na_2O + LiO_2$
0 to 1.0%	Fe_2O_3
0 to 0.05%	CaO
residue	ZrO_2,

and consisting essentially of the following refractory basic material composition (in % by mass):

25 to 50%	sintered bauxite
1 to 10%	alumina
0.1 to 3.0%	amorphous silica
0.3 to 1%	aluminium metaphosphate
0.5 to 4%	alkali silicates with a molar ratio of 1:2 to 1:4
residue	zirconium silicate,

and the following grain fraction:

20 to 35%	:up to 0.06 mm
25 to 60%	0.06 to 0.5 mm
5 to 55%	0.5 to 5 mm.

5,066,625

METHOD OF MAKING CONTAMINATION-FREE CERAMIC BODIES

Warren H. Philipp, Olmsted Township, Cuyahoga County, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 9, 1990, Ser. No. 610,883
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 14 Claims

1. In a method of making a high temperature ceramic body wherein ceramic particles are mixed with a binder-deflocculant (BD) composition, formed into a structure and subsequently sintered the improvement comprising the use of a binder-deflocculant comprising a guanidine salt of a polymeric acid (polyelectrolyte) having a molecular weight of from about 1,000 to about 5,000,000.

5,066,626

CERAMIC MATERIALS FOR USE IN INSERT-CASTING AND PROCESSES FOR PRODUCING THE SAME

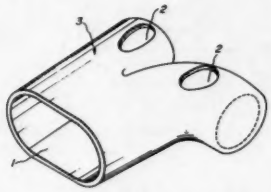
Kaname Fukao, Inuyama; Toshiyuki Hamanaka, Suzuka; Takashi Harada, and Noboru Kondo, both of Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,486

Claims priority, application Japan, Dec. 2, 1988, 63-304002; Feb. 17, 1989, 1-38900

Int. Cl.[5] C04B *35/10, 35/46, 35/50*

U.S. Cl. 501—128 15 Claims



1. A sintered ceramic material for use in insert casting, comprising:

at least 65% by volume aluminum titanate as a crystalline phase, the diameter of crystals of aluminum titanate being at least 10 μm; and

a glass intergranular phase present in an amount of not more than 20% by volume, said glass phase comprising a rare earth element in an amount of 0.5–16% by weight when calculated in the form of an oxide;

wherein said sintered ceramic material has a porosity of 5–35%, a four-point bending strength of 0.2–1.7 kgf/mm^2, a Young's modulus of 50–2,000 kgf/mm^2 and a reduction rate in cooling-heating cycling of not more than 9%.

5,066,627

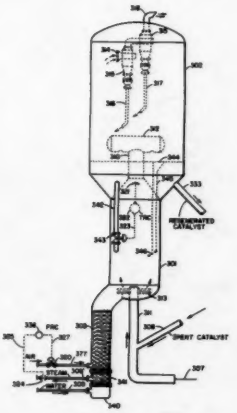
PROCESS FOR SIMULTANEOUS HEATING AND COOLING A FAST FLUIDIZED BED CATALYST REGENERATOR

Hartley Owen, Belle Meade, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 8, 1990, Ser. No. 535,459

Int. Cl.[5] B01J *21/20, 38/38, 38/32;* C10G *11/18*

U.S. Cl. 502—43 11 Claims



1. A process for the simultaneous heating and cooling of coked fluidized catalytic cracking catalyst during high efficiency regeneration in a fast fluidized bed regeneration zone which comprises:

decoking coked fluidized catalytic cracking catalyst by contact with an oxygen-containing regeneration gas in a coke combustor operating at coke combustion conditions including a coke combustor temperature and a superficial vapor velocity sufficient to maintain said catalyst as a fast fluidized bed in said coke combustor and to at least partially decoke said catalyst to produce a dilute phase mixture of at least partially decoked catalyst and flue gas and;

discharging said dilute phase mixture up through a dilute phase transport riser and separating said dilute phase mixture to form a flue gas phase with reduced catalyst content and a bubbling dense phase fluidized bed of catalyst having a higher temperature than the coke combustor temperature; characterized by simultaneously

heating said coked catalyst in said coke combustor by direct contact heat exchange with catalyst from said bubbling dense bed by recycling to said coke combustor at least a portion of the catalyst from said bubbling dense bed to form a dense phase mixture of recycled and coked catalyst; and

cooling said dense phase mixture in said coke combustor by allowing at least a portion of said dense phase mixture of recycled and coked catalyst to flow down from said coke combustor to a heat removal zone extrinsic from said coke combustor and cooling said dense phase mixture in said extrinsic heat removal zone by indirect heat exchange with a cooling fluid to produce a cooled dense phase catalyst mixture and fluidizing said dense phase catalyst mixture in said heat removal zone by passage of a fluidizing gas in direct contact with said dense phase catalyst mixture, said fluidizing gas being added in an amount sufficient to provide a superficial vapor velocity sufficient to cause said dense phase catalyst mixture to flow up from said extrinsic cooler to said coke combustor.

5,066,628

CATALYST AND PROCESS FOR HIGH SELECTIVITY REFORMING WITH PT/RE ON BA-K-L ZEOLITE

Jeffrey T. Miller, and Victor K. Shum, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 287,397, Dec. 20, 1988, Pat. No. 4,954,245.

This application May 23, 1990, Ser. No. 528,038

Int. Cl.[5] B01J *29/30, 29/36*

U.S. Cl. 502—66 5 Claims

1. A reforming catalyst formed by a process comprising calcining at less than 550° F. an unsulfided Zeolite L component having cationic sites ion exchanged with at least one member selected from the group consisting of potassium and barium; said catalyst further comprising a Group VIII noble metal component and a rhenium component; said rhenium component being incorporated onto the Zeolite L by impregnation with a rhenium-containing solution; where the ratio of the noble metal component to the rhenium component is from about 0.1:1 to about 10:1.

4. The catalyst of claim 1 wherein a binder is added to said catalyst.

5,066,629

OXIDATIVE COUPLING CATALYST FOR METHANE

Christopher A. Lukey, Queensland; Ashit M. Maitra, Hillsdale, and Ralph J. Tyler, Elanora Heights, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Filed Jul. 2, 1990, Ser. No. 545,958

Claims priority, application Australia, Jun. 30, 1989, PJ5021; Aug. 16, 1989, PJ5806

Int. Cl.[5] B01J *21/16, 23/02*

U.S. Cl. 502—84 18 Claims

1. A catalyst for the oxidative coupling of methane, compris-

ing a compound of a Group IIA element that is capable, under reaction conditions, of existing at least partly in its oxide or carbonate forms, intimately mixed with a clay capable of enhancing the catalyst performance.

6. A catalyst as claimed in any one of claims 1 to 5 in which the catalyst additionally contains a group IA element that is capable, under the reaction conditions of existing at least partly in its oxide or carbonate form.

5,066,630

METHOD FOR REMOVING NITROGEN-CONTAINING ORGANIC COMPOUNDS FROM CRYSTALLINE METALLOSILICATE

Masaru Kitamura; Hiroshi Ichihashi, and Gohfu Suzukamo, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 13, 1990, Ser. No. 537,432
Claims priority, application Japan, Jun. 30, 1989, 1-171007
Int. Cl.[5] B01J *37/08, 29/04*
U.S. Cl. 502—85 **4 Claims**

1. A method for removing nitrogen-containing organic compounds from crystalline metallosilicates which comprises firing the crystalline metallosilicates in the presence of a molecular oxygen-containing gas and a lower alcohol represented by the formula (I)

R—OH

wherein R represents an alkyl group of 1–4 carbon atoms.

5,066,631

HYDROCARBON SOLUTIONS OF ALKYLALUMINOXANE COMPOUNDS

Samuel A. Sangokoya; Milham S. Howie, and Todd A. Trumbo, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 16, 1990, Ser. No. 598,117
Int. Cl.[5] C08F *4/52*
U.S. Cl. 502—152 **19 Claims**

1. A hydrocarbon solvent solution of alkylaluminoxane comprising methylaluminoxane and an effective amount to solubilize said methylaluminoxane in said solvent of a tri-n-alkyl aluminum wherein the alkyl groups each contain at least two carbon atoms.

5,066,632

REFORMING CATALYST

William C. Baird, Jr., and George A. Swan, both of Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 253,423, Oct. 30, 1987, abandoned, which is a continuation of Ser. No. 944,329, Dec. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 873,589, Jun. 16, 1986, abandoned, which is a continuation of Ser. No. 782,113, Sep. 30, 1985, abandoned. This application Mar. 13, 1990, Ser. No. 492,210
Int. Cl.[5] B01J *27/045, 27/13, 21/04*
U.S. Cl. 502—223 **13 Claims**

1. A catalyst useful for reforming a naphtha feed at high severity reforming conditions, which comprises the metals, platinum, rhenium and iridium on a refractory porous inorganic oxide support, said support consisting essentially of alumina, wherein the concentration by weight of each of the metals platinum and rhenium is at least 0.1 percent and iridium at least 0.15 percent and at least one of the metals is present in a concentration of at least 0.3 percent, and the sum-total concentration of the metals is greater than 0.9 percent, and wherein each catalyst particle contains all three of the metals platinum, rhenium and iridium.

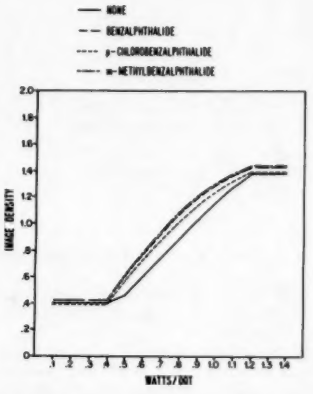
13. The composition of claim 1 wherein the catalyst contains from about 0.1 percent to about 3 percent of a halogen and from about 0.05 percent to about 0.2 percent sulfur.

5,066,633

SENSITIZER FOR HEAT SENSITIVE PAPER COATINGS

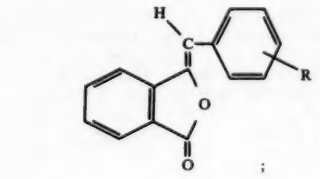
Tomoo Shibata, Amherst; John Semler, Buffalo, and George Gaesser, North Tonawanda, all of N.Y., assignors to Graphic Controls Corporation, Buffalo, N.Y.

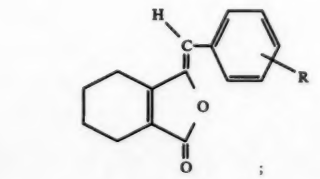
Filed Feb. 9, 1990, Ser. No. 478,259
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—209 **23 Claims**

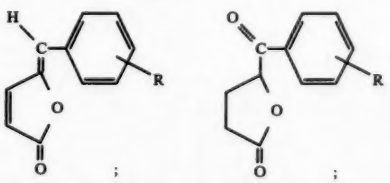


1. A heat sensitive composition comprising a colorless or light-colored dye precursor and a color developer capable of developing a color of said dye precursor with heating, said dye comprising a molecule having a five-membered spirol lactone ring on one portion, and a tertiary amino group on another portion of said molecule;

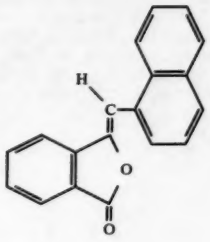
said heat sensitive composition further containing a sensitizing compound selected from the group consisting of:







where R is selected from the group consisting of a C_1–C_4 alkane, a C_1–C_4 alkylhalide, a halogen, and hydrogen; and



23. A heat sensitive recording material comprising the composition of claim 1 coated on a paper substrate.

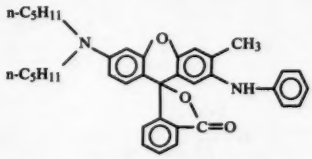
5,066,634

HEAT-SENSITIVE RECORDING SHEET

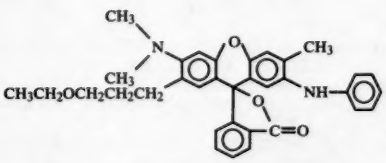
Toshiaki Minami; Tadakazu Fukuchi; Reiji Ohashi, and Toshio Kaneko, all of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 588,834
Claims priority, application Japan, Sep. 30, 1989, 1-255386
Int. Cl.[5] B41M *5/30*
U.S. Cl. 503—209 8 Claims

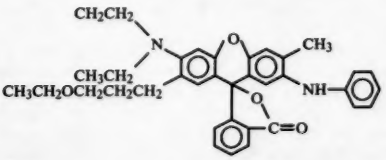
1. A heat-sensitive recording sheet comprising a support having thereon a color-developing layer which contains as main ingredients a colorless or pale colored basic chromogenic dye and an organic color-developing agent, wherein said color-developing layer comprises both 4-hydroxy-4'-n-propoxydiphenylsulfone as an organic color-developing agent and at least one fluorane-leuco dye selected from the dyes represented by the following formulae (I), (II) and (III) as a colorless or pale colored basic chromogenic dye:



(I)



(II)



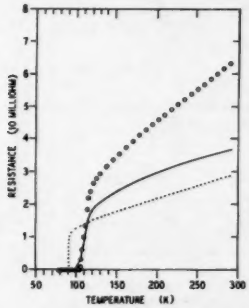
(III)

5,066,635

HIGH TEMPERATURE SUPERCONDUCTING TI-BA-CA-CU-O PHASES

Zhengzhi Sheng, Little Rock, Ark., and Allen M. Hermann, Golden, Colo., assignors to The University of Arkansas, Little Rock, Ark.

Continuation-in-part of Ser. No. 155,247, Feb. 12, 1988. This application Feb. 9, 1989, Ser. No. 308,895
Int. Cl.[5] C01F *11/02;* C01G *3/02, 15/00;* H01L *39/12*
U.S. Cl. 505—1 4 Claims



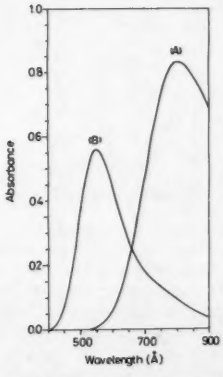
1. A high temperature superconductor phase of $Tl_2CaBa_2Cu_2O_{7+x}$, which has a tetragonal or pseudotetragonal unit cell dimensions of $5.44 \times 5.44 \times 29.5\ A^3$, and has a 15 A layer repeat of thallium oxide double layers and pairs of copper-oxygen planes separated by calcium.

5,066,636

CITRATE/ETHYLENEDIAMINE GEL METHOD FOR FORMING HIGH TEMPERATURE SUPERCONDUCTORS

Ru-Shi Liu, Hsinchu; Wang-Nang Wang, Taoyuan, and Chan-Ting Chang, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Aug. 15, 1990, Ser. No. 567,940
Int. Cl.[5] H01L *39/12;* H01B *1/08*
U.S. Cl. 505—1 2 Claims



1. A citrate/ethylenediamine gel method for producing homogeneous superconducting oxide powders comprising:

(a) dissolving nitrates of constituent metals in water in desired proportions;

(b) adding an aqueous solution of citric acid into the aqueous of mixture of (a) at one gram equivalent of citric acid for

each gram equivalent of metals until the total concentration of the metal ions is about 0.5 M;

(c) adding ethylenediamine dropwise into the solution with constant stirring until the pH is 6;

(d) heating the above solution to 80°–100° C. and holding for 1–2 hours to let gradually evaporate the water content until a deep blue gel is obtained;

(e) decomposing the gel at 500° C. for 2 hours until black solid particles having an average size of about 0.3 um formed are;

(f) calcining the decomposed particles at a temperature of 800° C. to 900° C. for about 10 hours;

(g) grinding the calcined particles and compressing the mixture to form a pellet;

(h) sintering the above pellet at a temperature range of about 800° C. to 1000° C.; and

(i) grinding the pellet in (h) to form a powdery metal oxide superconductive material.

5,066,637

GYROMAGNETIC-EFFECT CRYOGENIC GYROSCOPE FOR DETECTING ANGULAR VELOCITY

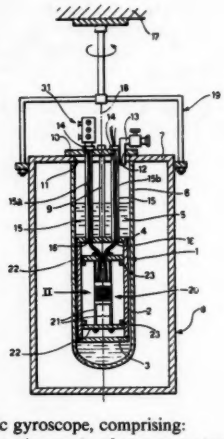
Massimo Cerdonio, Noventa di Piave, and Stefano Vitale, Trento, both of Italy, assignors to AERITALIA -Societa Aerospaziale Italiana S.p.A., Turin, Italy

Filed Jun. 23, 1988, Ser. No. 210,432

Claims priority, application Italy, Jun. 23, 1987, 67544 A/87

Int. Cl.[5] G01P *9/00, 3/44;* **G01C** *19/00;* **G01R** *33/035*

U.S. Cl. 501—1 **4 Claims**



1. A cryogenic gyroscope, comprising:

a closed rigid casing made of a superconducting material

cooling means for keeping said casing at a temperature no higher than its critical superconducting temperature; and

a rotation detector device supported rigidly within said casing by the walls thereof and comprising at least one component of ferromagnetic material adapted to be magnetized by rotation of said casing, said ferromagnetic material being constituted by a plurality of ferromagnetic strips intercalated with layers of electrically insulating material wherein said ferromagnetic strips are adapted to be operatively connected to a SQUID magnetometer for emitting signals indicative of magnetization of said ferromagnetic component.

5,066,638

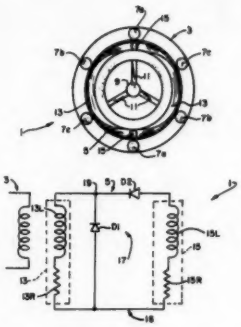
SUPERCONDUCTING MOTOR WITH MULTIPLE WINDING ROTOR

Jerry D. Lloyd, St. Louis, Mo., and M. A. Hilal, Madison, Wis., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 10, 1990, Ser. No. 579,863

Int. Cl.[5] H01B *12/12;* **H02K** *55/04*

U.S. Cl. 505—1 **18 Claims**



14. A poly-phase, self-energizing, air-core motor comprising:

a stator having three sets of windings;

a rotor including a large rotor winding and a small rotor winding, said windings being installed so their axes are orthogonal to each other and connected to form a current loop which is exposed to a magnetic field, said stator and rotor each being made from a superconductive material, and the ratio of turns of the large winding to the small winding being between 5:1 and 10:1; and,

means for trapping a maximum number of magnetic flux lines in the loop when the magnetic field is impressed thereon and for thereafter transferring the trapped flux between the large and small winding to run the motor, the loop acting as a perfect conductor whereby no flux change occurs within the loop after the flux lines are trapped.

5,066,639

CYCLOHEXENYLMETHYLOXABICYCLOOCTANES, PROCESSES FOR PREPARING SAME, INTERMEDIATES USED IN SAID PROCESSES AND ORGANOLEPTIC USES OF SAID CYCLOHEXENYLMETHYLOXABICYCLOOCTANES AND INTERMEDIATES THEREFOR

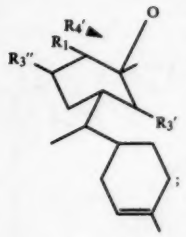
Anubhav P. S. Narula, Hazlet, and John J. DeVirgilio, Freehold, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

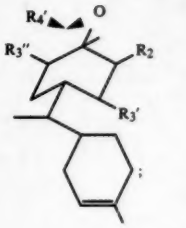
Division of Ser. No. 588,733, Sep. 27, 1990. This application Apr. 11, 1991, Ser. No. 683,715

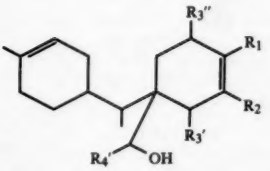
Int. Cl.[5] A01K *7/46*

U.S. Cl. 512—13 **7 Claims**

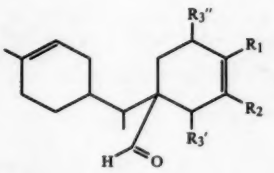
1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with said perfume composition, cologne or perfumed article an aroma augmenting or enhancing quantity of at least one substituted cyclohexene composition defined according to a structure selected from the group consisting of:







and



wherein R_1, R_2, R_3' and R_3'' each represents hydrogen or methyl with the provisos:

(i) one or both of R_1 and R_2 is methyl;

(ii) when R_1 and R_2 are both methyl, then R_3' and r_3'' are each hydrogen;

(iii) one of R_3' and R_3'' is methyl and the other is hydrogen or R_3' and R_3'' are both hydrogen, and

(iv) when R_3' or R_3'' is methyl then R_1 is methyl and R_2 is hydrogen;

and R_4' is hydrogen or C_1–C_5 alkyl.

5,066,640

PHENYLETHL O-METHYLCINNAMATE, A PROCESS FOR PREPARATION AND A FRAGRANCE COMPOSITION CONTAINING SAME

Erdmuthe Voss; Werner Moschinsky, and Doris Hofmann-Moritz, all of Munich, Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed May 11, 1989, Ser. No. 350,577

Claims priority, application Fed. Rep. of Germany, May 13, 1988, 3816452

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—21 **3 Claims**

1. Phenylethyl o-methylcinnamate.

2. A fragrance composition, comprising phenylethyl o-methylcinnamate.

5,066,641

3,5,5-TRIMETHYLHEXANAL OXIME AND ORGANOLEPTIC USES THEREOF

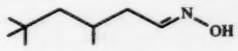
Anubhav P. S. Narula, Hazlet; John J. De Virgilio, Freehold, both of N.J., and Jan T. Van Elst, Et Hilversum, Netherlands, assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 27, 1990, Ser. No. 588,844

Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—25 **5 Claims**

1. The 3,5,5-trimethylhexanal oxime having the structure:



2. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to said perfume composition, cologne or perfumed article an aroma augmenting or enhancing quantity of the product defined according to claim 1.

5,066,642

ADAMANTYL COMPRISING TRIPEPTIDES, DERIVATIVES AND HYDROCHLORIDES THEREOF, THEIR PREPARATION AND USE

Branka Vranešić; Jelka Tomašić; Stanislav Smerdel; Darko Kantoci, all of Zagreb, Yugoslavia; Gianni Sava, Trieste, Italy, and Ivo Hršak, Zagreb, Yugoslavia, assignors to Imunoloski Zavod, Yugoslavia

Filed Feb. 9, 1990, Ser. No. 477,373

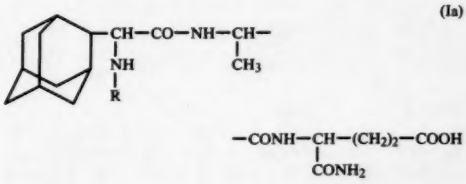
Claims priority, application Yugoslavia, Feb. 9, 1989, 305/89

Int. Cl.[5] A61K *37/00, 37/02;* **C07K** *5/00*

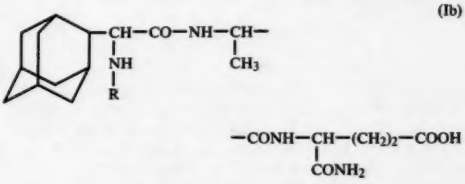
U.S. Cl. 514—18 **7 Claims**

1. A compound selected from the group consisting of 2-adamantyl- and 1-adamantyl-D/L-glycyl-L-alanyl-D-isoglutamine and their derivatives of the formulae

(Ia)



(Ib)



wherein R stands for a hydrogen atom or a MurNAc group, and hydrochlorides thereof.

5,066,643

FLUORINE AND CHLORINE STATINE OR STATONE CONTAINING PEPTIDES AND METHOD OF USE

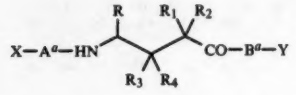
Robert H. Abeles, Waltham, Mass., and Michael H. Gelb, Seattle, Wash., assignors to Sandoz Ltd., Basle, Switzerland

Continuation of Ser. No. 311,022, Feb. 14, 1989, abandoned, which is a continuation of Ser. No. 131,089, Dec. 10, 1987, abandoned, which is a continuation of Ser. No. 829,263, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 702,651, Feb. 19, 1985, abandoned. This application Jan. 18, 1990, Ser. No. 466,803

Int. Cl.[5] A61K *37/02*; C07K *5/10, 7/06, 7/08*

U.S. Cl. 514—18 10 Claims

1. A compound of formula Ia



Ia

wherein R_1 and R_2 are independently fluorine or chlorine,

R_3 is hydroxy, alkoxy or acyloxy and

R_4 is hydrogen or

R_3 and R_4 together are oxo,

R is hydrogen, alkyl, cycloalkyl, cycloalkylalky, aryl, aralkyl, pyridinyl, pyridinylalkyl, thienyl, thienylalkyl, furyl, or furylalkyl optionally substituted in the aryl, pyridinyl, thienyl, or furyl ring,

X is hydrogen or a peptide amino-end blocking group,

Y is hydroxy or a peptide carboxy-end blocking group, and A^a and B^a are independently a peptide residue containing 1 to 7 natural amino acids, or an isoteric form thereof, in free form or in pharmaceutically acceptable salt form.

5,066,644

DERIVATIVES OF THIAZOLIDINE-4-CARBOXYLIC ACID, ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Stefano Poli; Germano Coppi, and Lucio Del Corona, all of Milan, Italy, assignors to Poli Industria Chimica S.p.A., Milan, Italy

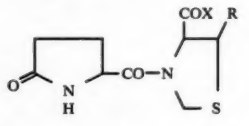
Filed Feb. 9, 1990, Ser. No. 477,507

Claims priority, application Italy, Feb. 10, 1989, 19401 A/89

Int. Cl.[5] C07K *5/06*; A61K *37/02*

U.S. Cl. 514—19 7 Claims

1. A compound of formula I



(I)

wherein X is a C_2–C_7 alkoxy or benzyloxy group, an amino group, the residue of a C_1–C_8 primary or secondary aliphatic amine optionally containing one or more double and/or triple bonds, of a C_4–C_8 cyclic aliphatic amine optionally containing an oxygen atom and benzylamine; R is hydrogen or C_1–C_8 alkyl.

5,066,645

EPIPODOPHYLLOTOXIN ALTROSIDE DERIVATIVES

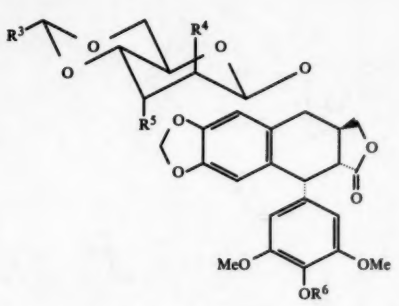
Takeshi Ohnuma, Tokyo; Hideaki Hoshi, Ichikawa; Hideo Kamei, Tokyo, and Takayuki Naito, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 1, 1989, Ser. No. 401,712

Int. Cl.[5] A61K *31/70*; C07H *15/20, 15/26*

U.S. Cl. 514—27 21 Claims

1. A compound having the formula:



X

wherein R^3 is selected from the group consisting of (C_1–C_{10}) alkyl, phenyl, furyl and 2-thienyl;

wherein one of R^4 and R^5 is selected from the group consisting of hydroxy, C_{1-5}alkoxy and C_{1-5}acyloxy; and the other is selected from the group consisting of H, hydroxy, C_{1-5}alkoxy, C_{1-5}acyloxy, F, azido, and amino; or one of R^4 and R^5 is F and the other is selected from the group consisting of azido and amino; and

R^6 is selected from the group consisting of hydrogen, P(O)$(OH)_2$ and alkali or alkaline earth metal salts thereof.

21. A pharmaceutical composition comprising an antitumor effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

5,066,646

AMPHOTERICIN DERIVATIVES

Michael J. Driver; Alexander R. Greenlees, and David T. MacPherson, all of Epsom, England, assignors to Beecham Group p.l.c., Brentford, England

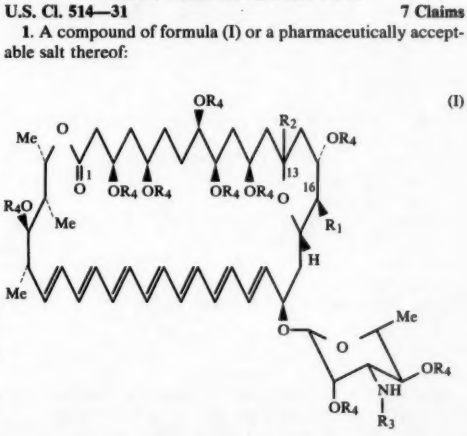
Filed Dec. 11, 1989, Ser. No. 448,698

Claims priority, application United Kingdom, Dec. 19, 1988, 8829592

Int. Cl.[5] A61K *31/70*; C07H *17/08*

U.S. Cl. 514—31 7 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein R_1 is a group -X-Y where X is a carbonyl group and Y is hydrogen, C_{1-8} alkyl, C_{2-8} alkenyl, or optionally substituted phenyl, naphthyl, a 5- or 6-membered monocyclic or 9- or 10-membered bicyclic heteroaryl containing one or two hetero atoms selected from the group consisting of nitrogen, oxygen and sulphur, which in the case of there being more than one heteroatom may be the same or different; and in which the optional substituents are selected from the group consisting of OH, C_{1-6} alkyl, C_{1-6} alkoxy, halogen and amino optionally

substituted by C_{1-6} alkyl; R_2 is hydroxy or C_{1-8} alkoxy; R_3 is hydrogen or an amine protection group selected from the group consisting of acetyl, trifluoroacetyl, 9-fluroenylmethoxycarbonyl, trichloroethoxycarbonyl, 2-methylsulphonylethoxycarbonyl and 2-trimethylsilylethoxycarbonyl and each R_4 is hydrogen.

7. A method of treatment of fungal infections in animals, which comprises administering an effective antifungal amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof, as defined in claim 1, to an animal in need of such treatment.

5,066,647

CYCLOPHOSPHAMIDE - ALANINE LYOPHILIZATES

Nageswara R. Palepu, and Julie A. Hutt, both of Dublin, Ohio, assignors to Erbamont, Inc., Dublin, Ohio

Continuation-in-part of Ser. No. 528,290, May 22, 1990, abandoned, which is a continuation of Ser. No. 340,978, Apr. 20, 1989, abandoned. This application Sep. 17, 1990, Ser. No. 583,896

Int. Cl.[5] A61K *31/66*; C07C *229/00*

U.S. Cl. 514—110 6 Claims

1. A lyophilized cyclophosphamide composition comprising cyclophosphamide, alanine and water wherein the amount of water ranges from approximately 0 parts to about 0.5 parts or from about 5.8 parts to about 8.2 parts per 100 parts by weight of cyclophosphamide, and wherein the amount of alanine is present in amount of about 50 to 150 parts per 100 parts by weight of cyclophosphamide.

5,066,648

PYROGLUTAMIC ACID ESTERS USED AS DERMAL PENETRATION ENHANCERS FOR DRUGS

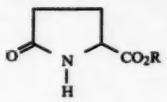
Jose Alexander, Lawrence, and Takeru Higuchi, deceased, late of Lawrence, both of Kans. by Martin B. Kickinson, Jr., executor , assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 348,914, May 8, 1989, Pat. No. 4,970,206, which is a continuation-in-part of Ser. No. 802,907, Nov. 29, 1985, Pat. No. 4,762,851. This application Sep. 13, 1990, Ser. No. 589,221

Int. Cl.[5] A61K *31/34, 31/52, 31/56, 31/58*

U.S. Cl. 514—174 17 Claims

1. A method of enhancing the rate of dermal absorption of a topically administered composition comprising a therapeutically effectically dosage amount of a drug selected from the group consisting of (i) and antiviral agent (ii) a dual cycloxygenase-lipoxygenase inhibitor and a pyroglutamic acid ester absorption enhancing agent of the formula:



wherein R is a straight or branched chain alkyl (C_5–C_{20}), alkenyl (C_5–C_{20}) with 1–6 double bonds, hydroxyalkyl (C_5–C_{20}), with 1–3 hydroxy groups, ketoalkyl (C_5–C_{20}), unsaturated hydroxyalkyl (C_5–C_{20}), carboxyalkyl (C_5–C_{20}) or alkoxycarbonylalkyl (C_5–C_{20}).

5,066,649

8,9-ANNELATED-1,2,3,4-TETRAHYDRO-β-CARBOLINE DERIVATIVES

Derk Hammings; Ineke van Wijngaarden, and Johannes W. C. M. Jansen, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

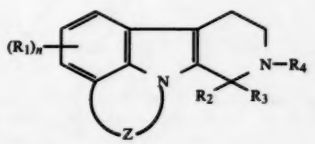
Filed Jan. 16, 1990, Ser. No. 465,460

Claims priority, application Netherlands, Jan. 19, 1989, 8900120

Int. Cl.[5] A61K *31/33, 31/38*; C07D *267/22, 487/00*

U.S. Cl. 514—183 3 Claims

1. A compound of formula 1



(1)

wherein

R_1 is straight or branched alkyl having 1–3 carbon atoms, straight or branched alkoxy or alkylthio having 1–4 carbon atoms, a group of the formula R_5R_6N—CO— wherein R_5 and R_6 independently of each other are hydrogen, alkyl having 1–3 carbon atoms or together with the nitrogen atom, form a heterocyclic 5- or 6-membered ring, hydroxy, halogen, cyano or trifluoromethyl;

n has the value 0 or 1;

Z, together with the two carbon atoms and the nitrogen atom, forms a heterocyclic group which consists of 9–12 ring atoms and which, in addition to the nitrogen atom already present, may comprises a sulfur atom as a second hetero atom, said heterocyclic group being unsubstituted or substituted by 1–4 methyl groups;

R_2 is hydrogen, or is selected from the group consisting of straight or branched alkyl having 1–8 carbon atoms, or alkenyl or alkynyl having 2–8 carbon atoms, said group being unsubstituted or substituted by one or more fluorine, with a phenyl group which is unsubstituted or substituted by halogen, alkyl having 1–3 carbon atoms, methoxy or trifluoromethyl, or cyclopropyl, or R_2 is cycloalkyl having 3–8 carbon atoms which is unsubstituted or substituted by one or more alkyl groups having 1–4 carbon atoms, or R_2 is cycloalkenyl having 5–7 carbon atoms or phenyl which is substituted by 0–2 R_7 groups, wherein R_7 is straight or branched alkyl having 1–4 carbon atoms which is unsubstituted or substituted by one or more fluorine atoms or two R_7 groups bound to adjacent carbon atoms form a ring annelated to the phenyl group and consist of 5–7 carbon atoms or R_7 is cycloalkyl, cycloalkoxy or cycloalkylthio having 3–7 carbon atoms, straight or branched alkoxycarbonyl having 1–4 carbon atoms in the alkoxy group, halogen or hydroxy;

R_3 is hydrogen or straight or branched alkyl having 1–6 carbon atoms; and

R_4 is hydrogen or straight or branched alkyl having 1–4 carbon atoms; or a pharmacologically acceptable salt or prodrug thereof.

5,066,650

METHOD FOR SUPPRESSING THE ENDOCRINE SYSTEM

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, N.Y.

Division of Ser. No. 498,289, Mar. 23, 1990, which is a continuation-in-part of Ser. No. 105,591, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 927,830, Nov. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 832,512, Feb. 21, 1986, abandoned, and a continuation of Ser. No. 708,228, Mar. 5, 1985, abandoned, which is a continuation-in-part of Ser. No. 363,588, Mar. 30, 1982, abandoned. This application Jan. 8, 1991, Ser. No. 638,623

Int. Cl.[5] A61K *31/555*

U.S. Cl. 514—185 **5 Claims**

1. A method of limiting the production of estrogenic steroidal hormones in animals in need of such limitation which comprises parenteral administration of from 5 to 50 um/kg b.w. of cobalt protoporphyrin or cobalt mesoporphyrin.

5,066,651

PYRROLIDONE COMPOUNDS FOR TREATING CEREBRAL DISORDERS

Gilbert Regnir, Chatenay Malabry; Alain Dhainaut; Jean Lepagnol, both of Chatout, all of France, and Jean Lepagnol, both of Chatou, France, assignors to Adir et Compagnie, Courbevoie, France

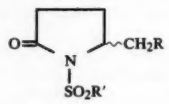
Filed May 17, 1990, Ser. No. 525,137

Claims priority, application France, May 31, 1989, 89 07153

Int. Cl.[5] A61K *31/495, 31/535, 31/54, 31/425*

U.S. Cl. 514—235.5 **12 Claims**

1. A compound selected from the group consisting of: Pyrrolidone compounds of the formula I:



(I)

in which:

R is selected from the group consisting of:

a) OR'' and SR'' groups in which R'' is selected from the group consisting of:

a hydrogen atom,

a COR''' radical in which R''' is selected from the group consisting of:

straight-chain and branched alkyl radicals having 1 to 4 carbon atoms, inclusive,

an N (R_1R_2) radical in which R_1 and R_2, which are the same or different, are each selected from the group consisting of straight-chain and branched alkyl radicals having 1 to 5 carbon atoms, inclusive, or R_1 and R_2 together represent a polymethylene chain having 4 to 6 carbon atoms, inclusive, and such a chain containing an oxygen atom, so as to form together with the nitrogen atom to which they are bonded a heterocyclic radical selected from pyrrolidinyl, piperidino, and morpholino radicals;

straight-chain and branched alkyl groups having 1 to 6 carbon atoms, inclusive and these groups containing one and more oxygen atoms, a hydroxy radical, or an —N (R_1R_2) radical in which R_1 and R_2 have the meanings defined above;

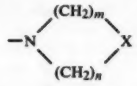
b) an —N (R_3R_4) radical in which:

R_3 and R_4, which are the same or different, are each selected from the group consisting of:

a hydrogen atom,

straight-chain and branched alkyl radicals having up to 6 carbon atoms and these radicals containing one or more oxygen atoms, a hydroxy radical, 0 COR''', or N (R_1R_2) radicals in which R''', R_1 and R_2 have the meanings defined above, or

R_3 and R_4, together with the nitrogen atom to which they are bonded, form a heterocyclic radical of the formula:



in which:

m is selected from zero, one and two;

n is an integer of from 1 to 3, inclusive, and

x is selected from the group consisting of:

a methylene radical (—CH_2—);

an oxygen or sulfur atom, or the radical SO_2;

an >N—R_5 radical in which R_5 is selected from the group consisting of:

alkyl radicals having 1 to 4 carbon atoms, inclusive,

a hydroxy alkyl radical having 1 to 4 carbon atoms, inclusive,

an (unsubstituted aryl) alkyl radical in which the alkyl moiety has 1 to 4 carbon atoms, inclusive, and such aralkyl radicals in which the aryl moiety is mono or polysubstituted by (C_1–C_4) alkoxy or a methylenedioxy radical,

unsubstituted aryl radicals and such aryl radicals mono or polysubstituted by halogen or (C_1–C_4) alkoxy radicals, and

heterocyclic radicals, having one or two heteroatoms, selected from thiazolyl, pyrimidinyl, pyrazinyl, pyridyl and quinolyl radicals, and such radicals mono or poly-substituted by halogen, trifluoromethyl, or (C_1–C_4) alkoxy radicals; and

a >CH—YZ radical in which:

Y is selected from oxygen and sulfur atoms, and

Z is selected from heterocyclic radicals having one or two heteroatoms as defined above;

R' is selected from the group consisting of:

a) straight-chain and branched alkyl radicals having 1 to 4 carbon atoms, inclusive, such radicals containing a double bond, and such radicals mono or polysubstituted by hydroxy, trifluoromethyl, amino, —N (R_1R_2) as defined above, phenyl, halophenyl, (C_1–C_5-alkyl) phenyl, (C_1–C_5 alkoxy) phenyl, nitrophenyl, or aminophenyl radicals; and

b) aryl, halo-aryl, (C_1–C_5-alkyl)-aryl, (C_1–C_5-alkoxy)-aryl, nitroaryl, and amino-aryl radicals; and

the carbon located in the 5-position of the pyrrolidine ring, which is substituted by CH_2R, has the R or S configuration,

and physiologically-tolerable acid addition salts thereof.

12. A method for treating a living animal afflicted with a cerebral disorder associated with lack of oxygen due to insufficient oxygen intake or metabolic neuronal deficiency, comprising the step of administering to the said living animal an amount of a compound of any of claims **1** through **10** which is effective for alleviation of the said condition.

5,066,652

THIOMETHYL AND SULFINYLMETHYL DERIVATIVES HAVING GASTRIC ACID ANTISECTETORY ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

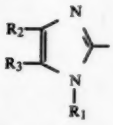
Paolo Chiesi; Vittorino Servadio, and Roberta Razzetti, all of Parma, Italy, assignors to Chiesi Farmaceutici S.p.A., Parma, Italy

Continuation of Ser. No. 223,160, Jul. 22, 1988, abandoned. This application Mar. 14, 1990, Ser. No. 494,864
Claims priority, application Italy, Jul. 31, 1988, 21538 A/87
Int. Cl.[5] A61K *31/415;* C07D *233/56*
U.S. Cl. 514—235.8 9 Claims

1. A compound of the formula

Het-S(O)$_n$-CH$_2$-A

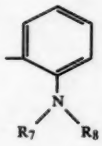
in which Het has the formula



wherein R_1 is H, C_1–C_4 alkyl, benzyl or phenyl which can be substitued by C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl or halogen at any postion; R_2 and R_3 are H or phenyl, provided that when R_1 is H, R_2 and R_3 are both phenyl;

A has the formula

(IV)



wherein R_7 and R_8, which may be the same or differenct, are H, hydroxyalkyl, C_1–C_4 alkyl which may be interrupted by the heteroatoms O or N, or together with the N atom to which they are bonded, form a pyrrolidine, piperidine, piperazine or morpholine ring;

and n is 0 or 1.

5,066,653

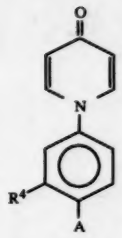
CHEMICAL COMPOUNDS

William J. Coates, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

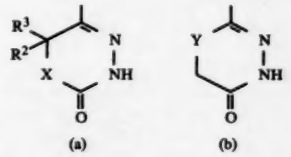
Division of Ser. No. 918,425, Oct. 14, 1986, Pat. No. 4,906,628. This application Dec. 18, 1989, Ser. No. 452,072
Claims priority, application United Kingdom, Oct. 17, 1985, 8525654; Jan. 23, 1986, 8601667
Int. Cl.[5] C07D *401/10, 417/10, 413/10;* A61K *31/50*
U.S. Cl. 514—242 10 Claims

1. A compound of the formula (1):

(1)



or a pharmaceutically acceptable salt thereof, wherein A is a group of sub-formula (a) or (b):



(a) (b)

X is NH;

R^2 is hydrogen or methyl;

R^3 is hydrogen;

Y is NH; and

R^4 is hydrogen.

7. A method for stimulating cardiac activity in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

8. A method for effecting bronchodilatation in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

9. A method for effecting phosphodiesterase (type III) inhibition in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

10. A method for treating congestive heart failure in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

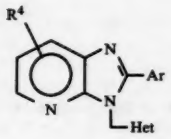
5,066,654

2-ARYL-3-HETEROCYCLICMETHYL-3H-IMIDAZO[4,5-B]PYRIDINES AS ANXIOLYTICS AND ANTICONVULSANTS

Chandler R. Taylor, Jr., Mechanicsville, and Meredith Moses, Glen Allen, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

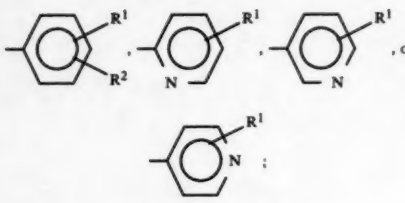
Filed Oct. 22, 1990, Ser. No. 601,967
Int. Cl.[5] A61K *31/505, 31/435;* C07D *471/04*
U.S. Cl. 514—256 19 Claims

1. A compound having the formula

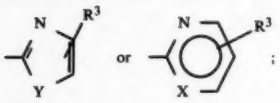


wherein

Ar is



Het is



R^1, R^2, and R^3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, aralkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, halo, cyano, or nitro;

R^4 is hydrogen, alkyl of 1–6 carbon atoms, aralkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, carbalkoxy of 2–7 carbon atoms, halo, or trifluoromethyl;

Y is NH, O, or S;

X is CH, or N;

or a pharmaceutically acceptable salt thereof.

5,066,655

N6-SUBSTITUTED 9-METHYLADENINES: A NEW CLASS OF ADENOSINE RECEPTOR ANTAGONISTS

Ray A. Olsson, Tampa, Fla., assignor to Whitby Research, Inc., Irvine, Calif.

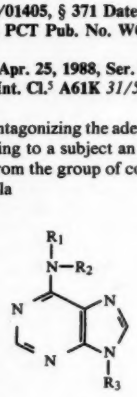
PCT No. PCT/US88/01405, § 371 Date Oct. 6, 1989, § 102(e) Date Oct. 6, 1989, PCT Pub. No. WO88/08303, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 25, 1988, Ser. No. 424,293

Int. Cl.[5] A61K *31/52*

U.S. Cl. 514—261 **4 Claims**

1. The method of antagonizing the adenosine receptor which comprises administering to a subject an effective amount of a compound selected from the group of compounds represented by the general formula



wherein R is selected from the group consisting of cycloalkyl radicals having from 3 to 7 ring carbon atoms, alkyl radicals having from 1 to 10 carbon atoms, aryl radicals having from 6 to 10 carbon atoms, aralkyl radicals having from 8 to 10 carbon atoms and heteroatom substituted derivatives thereof wherein said heteroatom may be selected from the group consisting of halogen, nitrogen, phosphorus, sulfur and oxygen; R_2 may be hydrogen or R and R_3 is an alkyl group comprising from 1 to 4 carbon atoms.

5,066,656

PHARMACOLOGICALLY ACTIVE (6,7-DIHYDRO-5H-PYRROLO[1,2-C]IMIDAZOL-5-YL)- AND (5,6,7,8-TETRAHYDROIMIDAZO[1,5-A]PYRIDIN-5-YL) SUBSTITUTED 1H-BENZOTRIAZOLE DERIVATIVES

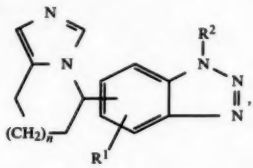
Michael N. Greco, Lansdale, Pa., and Marcel A. C. Janssen, Vosselaar, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 430,030, Nov. 1, 1989, abandoned. This application Sep. 10, 1990, Ser. No. 580,393

Int. Cl.[5] A61K *31/435, 31/415;* **C07D** *471/04, 487/04*

U.S. Cl. 514—269 **9 Claims**

1. A compound having the formula



(I)

a pharmaceutically acceptable acid addition salt thereof or a stereochemically isomeric form thereof, wherein

n is 0 or 1;

R^1 is hydrogen, nitro, amino, mono- or di(C_{1-6}alkyl)amino, halo, C_{1-6}alkyl, hydroxy or C_{1-6}alkyloxy;

R^2 is hydrogen; C_{1-10}alkyl; C_{3-6}alkenyl; C_{3-6}alkynyl; C_{3-7}cycloalkyl; bicyclo[2.2.1]heptan-2-yl; 2,3-dihydro-1H-indenyl; 1,2,3,4-tetrahydronaphthalenyl; phenyl; substituted phenyl; C_{1-10}alkyl substituted with phenyl, substituted phenyl, naphthalenyl, thienyl, furanyl, C_{1-4}alkylfuranyl, C_{3-7}cycloalkyl, hydroxy or with C_{1-6}alkyloxy; or a radical of formula —OR^3;

R^3 is hydrogen; C_{1-10}alkyl; C_{3-6}alkenyl; phenylC_{3-6}alkenyl; C_{3-6}alkynyl; pyrimidinyl; diphenylmethyl; 1-C_{1-4}alkylpiperidin-4-yl; C_{1-10}alkyl substituted with halo, hydroxy, C_{1-6}alkyloxy, amino, mono- or di(C_{1-6}alkyl)amino, trifluoromethyl, cyano, aminocarbonyl, hydroxycarbonyl, C_{1-6}alkyloxycarbonyl, phenyl, substituted phenyl, thienyl, furanyl, C_{1-4}alkylfuranyl, pyridinyl, di(C_{1-6}alkyl-)isoxazolyl, phenoxy, phenylthio, C_{3-7}cycloalkyl, 2,3-dihydro-1,4-benzodioxinyl, 1H-benzimidazolyl, C_{1-4}alkyl substituted 1H-benzimidazolyl, (1,1'-biphenyl)-4-yl or 2,3-dihydro-2-oxo-1H-benzimidazolyl; and

each substituted phenyl independently is phenyl substituted with from 1 to 3 substituents independently selected from halo, hydroxy, hydroxymethyl, trifluoromethyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkyloxycarbonyl, carboxyl, formyl, (hydroxyimino)methyl, cyano, amino, mono- and di(C_{1-6}alkyl)amino and nitro.

5,066,657

CROTONIC ACID AMIDE DERIVATIVES AND INSECTIDES CONTAINING THE SAME

Shunji Hayashi; Satoshi Yamanaka; Sayoko Kawaguchi; Teruhiko Ishii; Toshiya Kimata, and Naoaki Misu, all of Tokyo, Japan, assignors to SDS Biotech K.K., Tokyo, Japan

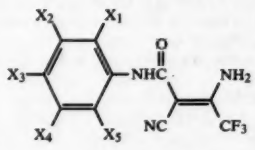
Filed May 8, 1990, Ser. No. 520,411

Claims priority, application Japan, May 9, 1989, 1-114090

Int. Cl.[5] A61K *31/275, 31/495;* **C07D** *239/02;* **C07C** *255/50*

U.S. Cl. 514—269 **5 Claims**

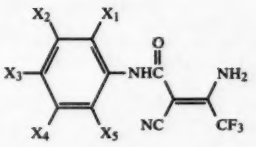
1. A crotonic acid amide derivative represented by formula (I):



(I)

wherein X_1, X_2, X_3, X_4, and X_5, which may be the same or different, each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted lower alkyl group, a substituted or unsubstituted lower alkoxy group, a lower haloalkyl group, a lower haloalkoxy group, a nitro group, a substituted or unsubstituted lower alkanesulfonyl group, a substituted or unsubstituted alkanesulfonyloxy group, a substituted or unsubstituted benzenesulfonyl group, a substituted or unsubstituted benzenesulfonyloxy group, a substituted or unsubstituted phenoxy group, a substituted or unsubstituted benzyloxy group, a dialkylamino group, a mono- or di-lower alkanesulfonylamino group, a substituted or unsubstituted lower alkylthio group, a $-SO_2R_1$ wherein R_1 represents a lower alkyl group or a lower haloalkyl group, a lower alkoxycarbonyloxy group, a substituted or unsubstituted alkoxycarbonyl group, a $-CH=N-OR_2$ group wherein R_2 represents a lower alkyl group, a substituted or unsubstituted pyrazolyl-1-yl group, a substituted or unsubstituted pyridyloxy group, or a pyrimidyl group; X_2 may be bonded to X_1 or X_3 to form a ring.

2. An insecticide composition comprising an insecticidal effective amount of a crotonic acid amine derivative represented by formula (I) below and a carrier:



(I)

wherein X_1, X_2, X_3, X_4 and X_5, which may be the same or different, each represents a hydrogen atom, a halogen atom, a substituted or unsubstituted lower alkyl group, a substituted or unsubstituted lower alkoxy group, a lower haloalkyl group, a lower haloalkoxy group, a nitro group, a substituted or unsubstituted lower alkanesulfonyl group, a substituted or unsubstituted alkanesulfonyloxy group, a substituted or unsubstituted benzenesulfonyl group, a substituted or unsubstituted benzenesulfonyloxy group, a substituted or unsubstituted phenoxy group, a substituted or unsubstituted benzyloxy group, a dialkylamino group, a mono- or di-lower alkanesulfonylamino group, a substituted or unsubstituted lower alkylthio group, a $-SO_2R_1$ wherein R_1 represents a lower alkyl group or a lower haloalkyl group, a lower alkoxycarbonyloxy group, a substituted or unsubstituted alkoxycarbonyl group, a $-CH=N-OR_2$ group wherein R_2 represents a lower alkyl group, a substituted or unsubstituted pyrazolyl-1-yl group, a substituted or unsubstituted pyridyloxy group, or a pyrimidyl group; X_2 may be bonded to X_1 to X_3 to form a ring, as an active ingredient.

5,066,658

SUBSTITUTED HYDROXYUREAS

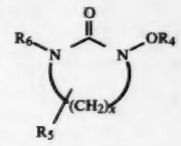
James P. Demers, New York, N.Y., and Richard B. Sulsky, Somerville, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 269,808, Nov. 10, 1988, abandoned, which is a continuation-in-part of Ser. No. 21,815, Mar. 4, 1987, abandoned. This application Feb. 7, 1990, Ser. No. 477,000

Int. Cl.[5] A61K *31/505, 31/415;* **C07D** *239/02, 235/30*

U.S. Cl. 514—269 **10 Claims**

1. A hydroxyurea selected from the group consisting of



III

wherein

R_4 is hydrogen or lower alkanoyl,

R_5 is C_5 to C_{10} alkyl or lower alkoxycarbonyl

R_6 is C_1 to C_{10} alkyl.

10. A method for treating an inflammatory skin disease of a mammal which comprises topically administering to a mammal an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

5,066,659

SPIRO-HETEROAZALONES FOR TREATMENT OF DIABETIC COMPLICATIONS

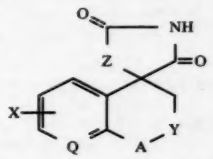
Christopher A. Lipinski, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 370,143, Jun. 23, 1989, abandoned, which is a continuation of Ser. No. 44,400, filed as PCT/US84/01767 Oct. 30, 1984, published as WO86/02647 May 9, 1986, abandoned. This application Jul. 12, 1990, Ser. No. 554,952

Int. Cl.[5] A61K *31/41;* **C07D** *471/10*

U.S. Cl. 514—278 **3 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof wherein,

A is methylene, hydroxymethylene or methine;

Y is methylene, alkylmethylene, methine, or alkylmethine wherein alkyl in each instance has 1–4 carbon atoms, with the proviso that when A is methine, Y is methine or alkylmethine;

Z is nitrogen substituted by hydrogen;

Q is nitrogen; and

X is in the 3′-position and is hydrogen, halo, alkyl, alkoxy having 1–4 carbon atoms alkylthio, alkylsulfinyl, alkylsulfonyl, phenoxy, phenylthio or nitro; or X is in the 2′-position and is hydrogen, alkyl or alkoxy having 1–4 carbon atoms; provided that when X s hydrogen A and Y cannot both be methylene.

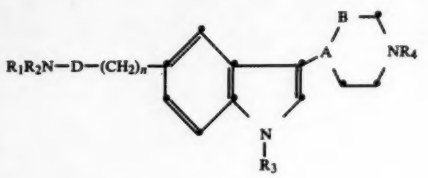
2. A pharmaceutical composition compriing a compuund according to claim 1 in an amount feffective for the treatment of diabetes-associated complications and a pharmaceutically acceptable carrier or diluent.

5,066,660
INDOLE DERIVATIVES

Alexander W. Oxford; Ian H. Coates, both of Hertford, and Darko Butina, Bedfordshire, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 231,260, Aug. 12, 1988, abandoned. This application Aug. 21, 1990, Ser. No. 570,513
Claims priority, application United Kingdom, Aug. 13, 1987, 8719167
Int. Cl.[5] C07D *401/04;* A61K *31/445*
U.S. Cl. 514—323 25 Claims

1. A compound of formula (I)



(I)

wherein

R_1 represents a hydrogen atom, or a C_{1-6} alkyl group;

R_2 represents a hydrogen atom, a C_{1-6} alkyl group, a C_{3-7} cycloalkyl group, a C_{3-6} alkenyl group, or a phenyl or phen(C_{1-3}) alkyl group in which the phenyl ring is optionally substituted by a halogen atom, a C_{1-4} alkoxy group, a hydroxy group or a C_{1-3} alkyl group;

R_3 represents a hydrogen atom, a C_{1-3} alkyl group or a group $—CO_2R_5$, $—COR_5$, $—COCO_2R_5$ or $—CONHR_5$, where R_5 represents a hydrogen atom, a C_{1-4} alkyl group, a C_{3-7} cycloalkyl group, a C_{2-4} alkenyl group or an aryl or ar(C_{1-4})alkyl group in which the aryl group is phenyl which may be unsubstituted or substituted by a halogen atom, a C_{1-4} alkoxy group, a C_{1-4} alkyl group or a hydroxy group, provided that when R_3 represents $—CO_2R_5$,

R_5 is other than hydrogen;

R_4 represents a hdyrogen atom, a C_{1-3} alkyl group, a C_{3-6} alkenyl group, a phenyl group or a phen(C_{1-3})alkyl group;

A—B represents the group CH—CH_2— or C═CH—;

D represents the group $—SO_2—$;

n represents zero or an integer from 1 to 5;

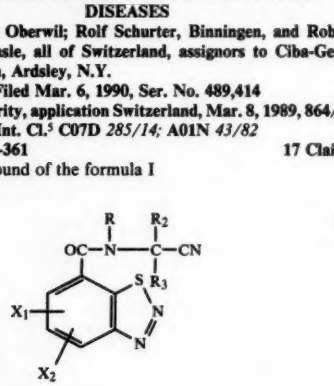
or a pharmaceutically acceptable salt or solvate thereof, provided that when n is 2, R_3 is hydrogen and R_4 is hydrogen or C_{1-3} alkyl, then R_2 is other than hydrogen or C_{1-6} alkyl.

5,066,661
AGENTS FOR PROTECTING PLANTS AGAINST DISEASES

Walter Kunz, Oberwil; Rolf Schurter, Binningen, and Robert Nyfeler, Basle, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1990, Ser. No. 489,414
Claims priority, application Switzerland, Mar. 8, 1989, 864/89
Int. Cl.[5] C07D *285/14;* A01N *43/82*
U.S. Cl. 514—361 17 Claims

1. A compound of the formula I



(I)

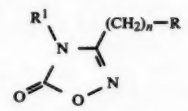
in which X_1 and X_2 independently of one another are hydrogen or 1 to 3 halogen; R is hydrogen, C_1–C_4alkyl, or C_3–C_5alkenyl; R_2 is C_1–C_6alkoxy, or is C_1–C_6alkylthio, or is furyl or thienyl, each of which is bonded in the 2- or 3-position; and R_3 is hydrogen or C_1–C_4alkyl.

5,066,662
SUBSTITUTED OXAZOLIDIN-2-ONES AND 1,2,4-OXADIAZOLIN-5-ONES AND DERIVATIVES THEREOF ACTING AT MUSCARINIC RECEPTORS

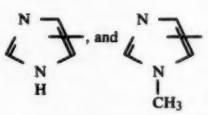
Sheila H. Hobbs, Dexter, and Stephen J. Johnson, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 21, 1990, Ser. No. 526,422
Int. Cl.[5] A61K *31/41;* C07D *413/06*
U.S. Cl. 514—364 5 Claims

1. A compound of Formula I



wherein R is selected from the group consisting of



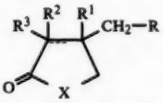
R^1 is a hydrogen, alkyl of from one to ten carbon atoms, alkynyl of from two to ten carbon atoms, phenyl or phenyl substituted by one to four substituents selected from C1-C10 alkyl, C1-C10 alkoxy, C1-C10 alkyl thio, halogen or trifluoromethyl; n is zero or an integer of one or two; or a pharmaceutically acceptable acid addition salt thereof.

5,066,663
SUBSTITUTED-HETERO-CYCLOPENTANONES AND CYCLOPENTENONES AND DERIVATIVES THEREOF ACTING AT MUSCARINIC RECEPTORS

Sheila H. Hobbs, Dexter, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

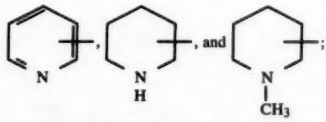
Filed May 21, 1990, Ser. No. 526,361
Int. Cl.[5] A61K *31/44;* C07D *405/02*
U.S. Cl. 514—326 6 Claims

1. A compound of Formula I



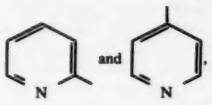
I

wherein X is oxygen, sulfur, or —N—R^4 wherein R^4 is hydrogen or alkyl of from one to ten carbon atoms; R is selected from the group consisting of



R^1, R^2, and R^3 are each independently hydrogen, alkyl of from one to ten carbon atoms, alkynyl of from two to ten carbon atoms or, phenyl or phenyl substituted by one to four substituents selected from C_1–C_{10} alkyl, alkoxy, C_1–C_{10}, halogen or

trifluromethyl; ---------- represents a single or double bond with the proviso that when ------ represents a double bond R^1 and R^2 are absent; or a pharmaceutically acceptable acid addition salt thereof, excluding a compound wherein X is oxygen; R is selected from the group consisting of



R^1 is hydrogen; R^2 is hydrogen; R^3 is alkyl of from one to ten carbon atoms; and represents a single bond.

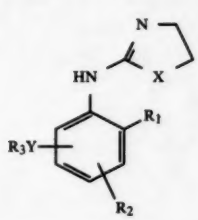
5,066,664

2-(HYDROXY-2-ALKYLPHENYLAMINO)-OXAZOLINES AND THIAZOLINES AS ANTI-GLAUCOMA AND VASOCONSTRICTIVE AGENTS

Charles Gluchowski, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Feb. 28, 1990, Ser. No. 486,382
Int. Cl.[5] C07D *263/28;* A61K *31/42*
U.S. Cl. 514—377 21 Claims

1. A compound of the formula



where X is O R_1 is selected from a group consisting of straight chain lower alkyl having 1 to 6 carbons and branched chain lower alkyl having only primary, secondary or tertiary carbons adjacent to the phenyl ring and a total of 6 carbons; R_2 is selected from a group consisting of H straight chain lower alkyl having 1 to 6 carbons and branched chain lower alkyl having only primary, secondary or tertiary carbons adjacent to the phenyl ring and a total of 6 carbons, or OR^*_2 where R^*_2 is lower alkyl having 1 to 6 carbons; Y is O, S or NH; and R_3 is H, or $C(O)R^*_3$ where R^*_3 is lower alkyl having 1 to 5 carbons, with the proviso that the YR_3 group is not disposed in ortho position on the benzene nucleus relative to the NH—(C=N—CH_2—CH—X) group, and a pharmaceutically acceptable salt thereof.

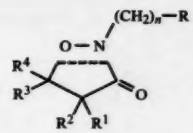
5,066,665

SUBSTITUTED ISOXAZOLIDIN-3-ONES AND DERIVATIVES THEREOF ACTING AT MUSCARINIC RECEPTORS

Sheila H. Hobbs, Dexter, Mich., assignor to Warner-Lambert Co., Morris Plains, N.J.

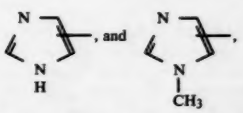
Filed May 21, 1990, Ser. No. 526,350
Int. Cl.[5] C07D *413/12;* A61K *31/42*
U.S. Cl. 514—380 5 Claims

1. A compound of Formula I



I

wherein R is selected from the group consisting



R^1, R^2, R^3, and R^4 are each independently hydrogen, alkyl of from one to ten carbon atoms, alkynyl of from two to ten carbon atoms, phenyl or phenyl substituted by one to four substituents selected from C1–C10alkyl, alkoxy, C1–C10halogen or trifluoromethyl; n is an integer of one or two; or a pharmaceutically acceptable acid addition salt thereof.

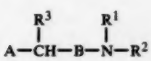
5,066,666

AMINOAZOLE DERIVATIVES AND THEIR PRODUCTION AND USE

Yukinori Ozato, Takarazuka; Nobuhiko Tamura, Toyonaka; Hiroaki Masumori, Ibaraki; Michihiro Yamamoto, Nishinomiya; Atsuyuki Kojima, Takarazuka; Fumio Nishikaku, Itami, and Yoshihiko Kimura, Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

Division of Ser. No. 55,079, May 28, 1987, Pat. No. 4,914,112.
This application Jan. 26, 1990, Ser. No. 470,731
Claims priority, application Japan, Jun. 3, 1986, 61-128910; Jul. 11, 1986, 61-164508
Int. Cl.[5] C07D *261/14, 31/42*
U.S. Cl. 514—380 7 Claims

1. A compound of the formula:

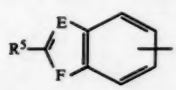


wherein A is the group of the formula:

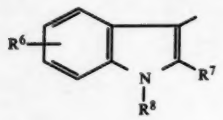
$$Ar^1—D—Ar^2—$$

wherein Ar^1 is phenyl or thienyl which may be optionally substituted with at least one of the same or different halogen; Ar^2 is phenylene or thienylene which may be optionally substituted with at least one of the same or different halogen; D is a divalent radical selected from the group consisting of >C=N—OR^4 wherein R^4 is hydrogen or lower alkyl, >C=O,

>CHOH, >NH and a single bond, or A is the group of the formula:



wherein R^5 is lower alkoxy or phenyl which may be optionally substituted with at least one of the same or different halogen; E is methine or nitrogen; F is vinylene or oxygen, or a is a group of the formula:



wherein R^6 is lower alkoxy; R^7 is lower alkyl; R^8 is benzoyl which may be optionally substituted with at least one of the same or different halogen, B is the divalent azole group, isoxazolediyl R^1 is hydrogen or lower alkyl; R^2 is hydrogen, lower alkyl, phenyllower alkyl, or the group of the formula:

$$R^9—G—$$

wherein R^9 is hydrogen, lower alkyl, halo-lower alkyl, amino-lower alkyl, phenyl or phenyl-lower alkyl or the group of the formula:

wherein R^{10} is hydrogen or lower alkyl; R^{11} is hydrogen, lower alkyl, lower alkenyl, lower cycloalkyl, phenyl-lower alkyl, phenyl or aroyl, or the group of the formula: $—NR^{10}R^{11}$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl; or the group of the formula:

$$R^{12}—O—$$

wherein R^{12} is lower alkyl or polyhalo-lower alkyl; G is a divalent group selected from the group consisting of >C=O, >C=S, $>(C=O)_2$ and $>SO_2$ radical; and the group of the formula: $—NR^1R^2$ which is pyrrolidinyl, piperidinyl or hexahydroazepinyl; R^3 is hydrogen or lower alkyl, or its acid addition salts.

5,066,667

THIOXOTETRAZOLINES AND INSECTICIDAL USE THEREOF

Josef Ehrenfreund, Allschwil, and Erich Stamm, Huttil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

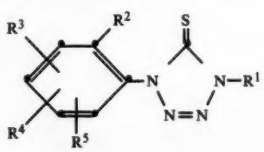
Filed Jun. 18, 1990, Ser. No. 539,755

Claims priority, application Switzerland, Jun. 26, 1989, 2369/89

Int. Cl.[5] C07D *257/04;* A01N *43/713*

U.S. Cl. 514—381 **15 Claims**

1. A 1-phenyl-5-thioxo-2-tetrazoline of formula I



(I)

in which

R^1 is C_1–C_8alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_6cycloalkyl, C_5–C_6-cycloalkenyl, C_1–C_4alkyl- or halo-substituted C_3–C_6cycloalkyl, C_1–C_4-alkyl- or halo-substituted C_5–C_6cycloalkenyl, halo-, C_1–C_4alkoxy- or phenyl-substituted C_3–C_6alkenyl, halo-, C_1–C_4alkoxy- or phenyl-substituted C_3–C_8alkynyl, or C_1–C_8alkyl that is substituted by halogen, C_1–C_4-alkoxy, C_1–C_4alkylthio, C_1–C_4alkoxycarbonyl, C_3–C_6cycloalkyl, phenyl, cyano, hydroxy, halophenyl, C_1–C_4alkylphenyl or by a heteroaromatic radical,

R^2 is C_1–C_6alkyl, C_2–C_6alkenyl, C_2–C_6alkynyl, C_3–C_6cycloalkyl, cyclopentenyl or cyclohexenyl, or is C_1–C_6alkyl that is substituted by halogen, by C_1–C_4alkoxy or by C_1–C_4alkylthio,

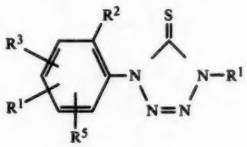
each of R^3 and R^4, independently of the other, is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_3–C_6cycloalkyl, C_2–C_4alkenyl, C_2–C_4alkynyl, C_2–C_6alkoxyalkyl, C_2–C_6alkylthioalkyl, C_1–C_4cyanoalkyl, phenyl-C_2–C_4alkenyl or phenyl-C_2–C_4alkynyl, or R^3 and R^4 together are a —CH=CH—CH=CH—, —CH_2—CH=CH—, —$(CH_2)_4$—, —$(CH_2)_3$—, —O—CH_2—O—, —O—CH_2—CH_2—O—, —CH_2—O—CH_2—, —$(CH_2)_2$—CH=CH— or —CH_2—CH=CH—CH_2— bridge, each of which may be substituted by one or two C_1–C_4alkyl groups, and

R^5 is hydrogen or a —Z—R^6 group in which

R^6 is phenyl, naphthyl or pyridyl, or is phenyl, napthyl or pyridyl each of which is substituted by one or two substituents selected from the group consisting of halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4haloalkyl, C_1–C_4alkylthio, C_1–C_4haloalkylthio, di-C_1–C_4alkylamino, nitro, cyano, C_1–C_4alkoxycarbonyl and C_1–C_4alkylcarbonyl, and

Z is oxygen, sulfur, a direct bond, —NH—, —N(C_1–C_2alkyl)—, —N(CHO)—, —CH_2—, —$CH(CH_3)$— or —$C(CH_3)_2$—.

14. A method of controlling insects and arachnids that are harmful to animals and plants which comprises treating said animals or plants or the locus thereof with an effective amount of a compound of formula I



(I)

in which

R^1 is C_1–C_8alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_6cycloalkyl, C_5–C_6-cycloalkenyl, C_1–C_4alkyl- or halo-substituted C_3–C_6cycloalkyl, C_1–C_4-alkyl- or halo-substituted C_5–C_6cycloalkenyl, halo-, C_1–C_4alkoxy- or phenyl-substituted C_3–C_6alkenyl, halo-, C_1–C_4alkoxy- or phenyl-substituted C_3–C_8alkynyl, or C_1–C_8alkyl that is substituted by halogen, C_1–C_4-alkoxy, C_1–C_4alkylthio, C_1–C_4alkoxycarbonyl, C_3–C_6cycloalkyl, phenyl, cyano, hydroxy, halophenyl, C_1–C_4alkylphenyl or by a heteroaromatic radical,

R^2 is C_1–C_6alkyl, C_2–C_6alkenyl, C_2–C_6alkynyl, C_3–C_6cycloalkyl, cyclopentenyl or cyclohexenyl, or is C_1–C_6alkyl that is substituted by halogen, by C_1–C_4alkoxy or by C_1–C_4alkylthio,

each of R^3 and R^4, independently of the other, is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_3–C_6cycloalkyl, C_2–C_4alkenyl, C_2–C_4alkynyl, C_2–C_6alkoxyalkyl, C_2–C_6alkylthioalkyl, C_1–C_4cyanoalkyl, phenyl-C_2–C_4alkenyl or phenyl-C_2–C_4alkynyl, or R^3 and R^4 together are a —CH=CH—CH=CH—, —CH_2—CH=CH—, —$(CH_2)_4$—, —$(CH_2)_3$—, —O—CH_2—O—, —O—CH_2—CH_2—O—, —CH_2—O—CH_2—, —$(CH_2)_2$—CH=CH— or —CH_2—CH=CH—CH_2— bridge, each of which may be substituted by one or two C_1–C_4alkyl groups, and

R^5 is hydrogen or a —Z—R^6 group in which

R^6 is phenyl, naphthyl or pyridyl, or is phenyl, naphthyl or pyridyl each of which is substituted by one or two substituents selected from the group consisting of halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, C_1–C_4haloalkyl, C_1–C_4alkylthio, C_1–C_4haloalkylthio, di-C_1–C_4alkylamino,

nitro, cyano, C_1-C_4alkoxycarbonyl and C_1-C_4alkylcarbonyl, and

Z is oxygen, sulfur, a direct bond, —NH—, —N(C_1-C_2alkyl)—, —N(CHO)—, —CH_2—, —$CH(CH_3)$— or —$C(CH_3)_2$—.

5,066,668

TRIAZOLE DERIVATIVES OF FENAMATES AS ANTIINFLAMMATORY AGENTS

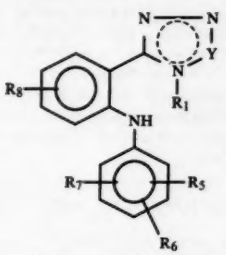
Diane H. Boschelli, Novi; David T. Connor, Ann Arbor, both of Mich.; Daniel L. Flynn, Mundelein, Ill.; Jagadish C. Sircar, Ann Arbor, and Milton L. Hoefle, both of, Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.

Division of Ser. No. 364,345, Jun. 9, 1989, Pat. No. 4,962,119. This application Apr. 3, 1990, Ser. No. 504,169

Int. Cl.[5] A61K *31/41*

U.S. Cl. 514—384 **6 Claims**

1. A pharmaceutical composition for use as an antiinflammatory agent comprising an antiinflammatory effective amount of a compound of the formula (I)



I

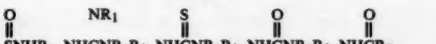
and a pharmaceutically acceptable salt thereof; wherein

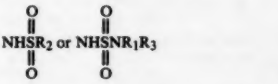
R_1 is hydrogen or lower alkyl;

Y is (1) C-SR_1 wherein R_1 is H or lower alkyl

wherein R_2 is lower alkyl,

wherein R_2 is independently defined above, (4) C-NR_1R_3 wherein R_1 is independently as defined above and R_3 is hydrogen or lower alkyl, (5) COR_1 wherein R_1 is independently as defined above, (6) CR_4 wherein R_4 is hydrogen, lower alkyl, halogen, CF_3, CO_2R_1, or





wherein R_1, R_2, and R_3 are independently as defined above; and

R_5, R_6, R_7 and R_8 are independently hydrogen, fluoro, chloro, bromo, iodo, trifluoromethyl, lower alkyl, CN, hydroxy, lower alkoxy, $-S(O)_n-$lower alkyl, NO_2, or NR_9R_{10} wherein R_9 or R_{10} are independently H, lower alkyl or acyl; and n is an integer of 0 through 2; additionally comprising an antiinflammatory effective amount of a second active ingredient that is a non-steroidal antiinflammatory drug and a pharmaceutically acceptable carrier.

5,066,669

BENZOFURAN DERIVATIVES

Tameo Iwasaki, Nishinomiya; Masaki Sugiura, Kawanishi; Yuzo Matsuoka, Toyonaka; Mamoru Matsumoto, Nara, and Kazuyuki Kitamura, Urawa, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

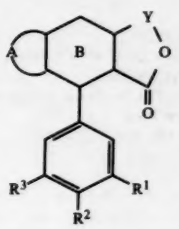
Filed Mar. 7, 1990, Ser. No. 489,565

Claims priority, application Japan, Mar. 9, 1989, 1-57349

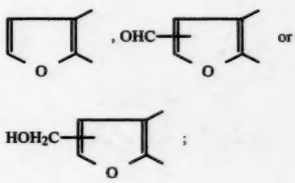
Int. Cl.[5] C07D *307/77;* **A61K** *31/34*

U.S. Cl. 514—449 **5 Claims**

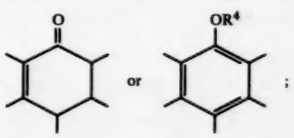
1. A benzofuran derivative of the formula:



wherein Ring A is a ring of the formula



ring B is a ring of the formula



R^1 is hydrogen; each of R^2 and R^3 is hydrogen or lower alkoxy, or R^2 and R^3 are combined together to form lower alkylenedioxy; R^4 is lower alkyl; and Y is methylene, or a pharmaceutically acceptable salt thereof.

5,066,670

MACROLIDE DERIVATIVES WITH PARASITICIDAL ACTIVITY

Roderick J. Dorgan, Epsom, and Graham S. Macaulay, Tadworth, both of England, assignors to Beecham Group p.l.c.

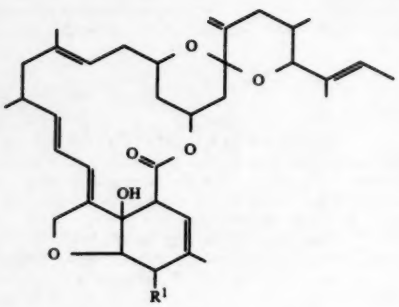
Filed Mar. 9, 1990, Ser. No. 491,564

Claims priority, application United Kingdom, Mar. 11, 1989, 8905605

Int. Cl.[5] A61K *31/365;* **C07D** *313/00, 307/93*

U.S. Cl. 514—450 **5 Claims**

1. A compound of formula (I):



(I)

wherein R^1 is methoxy or optionally protected hydroxy.

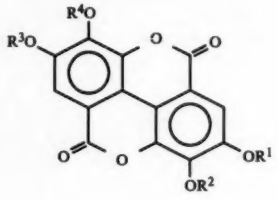
5,066,671

ELLAGIC ACID DERIVATIVES AS PHOSPHOLIPASE A_2 INHIBITORS

Craig E. Caufield, Middlesex, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 16, 1990, Ser. No. 552,659
Int. Cl.[5] A61K *31/35*
U.S. Cl. 514—453 **3 Claims**

1. A method of preventing or treating immunoinflammatory conditions in a mammal in need thereof by administering an immunoinflammatory amount of a compound having the formula

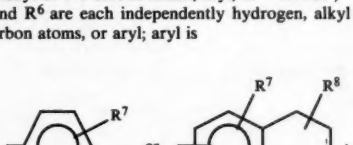


wherein

R^1, R^2, R^3, and R^4 are each, independently, hydroge, alkyl of 1–9 carbon atoms, aralkyl of 7–10 carbon atoms, aryl, or

X is alkyl of 1–6 carbon atoms, aryl, or $—NR^5R^6$;

R^5 and R^6 are each independently hydrogen, alkyl of 1–6 carbon atoms, or aryl; aryl is



where the dotted line represents an optional double bond;

R^7, R^8 and R^9 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, hydroxy, alkoxy of 1–6 carbon atoms, carbalkoxy of 2–7 carbon atoms, halo, nitro, amino, cyano, trifluoromethyl, or a carboxylic acid;

n=1–3;

or a pharmaceutically acceptable salt thereof.

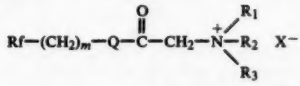
5,066,672

POLYFLUOROALKYL ACETATES, THIOACETATES AND ACETAMIDES, AND THEIR APPLICATIONS

Alain Sismondi; Parfait Abenin, and Aimé Cambon, all of Nice, France, assignors to Societe Atochem, France

Filed Dec. 27, 1989, Ser. No. 457,565
Claims priority, application France, Dec. 27, 1988, 88 17240
Int. Cl.[5] A01N *37/00;* **C07C** *69/74, 327/00, 229/00*
U.S. Cl. 514—513 **4 Claims**

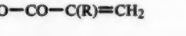
1. A compound of the formula:



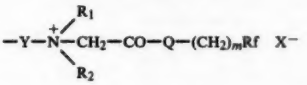
(I)

in which Rf denotes a linear or branched perfluoroalkyl radical containing from 2 to 16 carbon atoms, m is an integer ranging from 1 to 4, Q denotes an oxygen or sulphur atom or an NH group, X^- denotes an monovalent anion or its equivalent, R_1 denotes an alkyl radical containing from 1 to 3 carbon atoms, R_2 denotes allyl or a linear or branched alkyl radical containing from 1 to 18 carbon atoms, and R_3 denotes a linear or branched alkyl radical containing from 7 to 18 carbon atoms or one of the following radicals:

(II)



(III)



(IV)

wherein m, R_1, R_2, Q, Rf and X^- are such as defined above, n is an integer ranging from 2 to 4, R denotes hydrogen or methyl, Y denotes an alkylene bridge of 2 to 8 carbon atoms optionally interrupted by an oxygen atom, and Rf' denotes a perfluoroalkyl radical such as Rf.

4. A method of using the compound according to claim 1 as a surface-active agent or as a monomer for the manufacture of artificial vesicles.

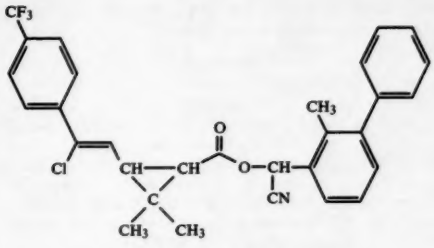
5,066,673

SUBSTITUTED BENZYL 2-PHENYL-1-ALK(EN)YLCYCLOPROPANE-CARBOXYLATES AND THE USE THEREOF FOR CONTROLLING PESTS

Winfried Zombik, Ilvesheim; Hans Theobald, Limburgerhof; Bernd Wolf, Fussgoenheim; Ludwig Schuster, Limburgerhof; Peter Hofmeister, Neustadt, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 22, 1990, Ser. No. 482,890
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907069
Int. Cl.[5] C07C *255/31, 69/743;* **A01N** *37/08*
U.S. Cl. 514—521 **5 Claims**

4. A pesticidal composition comprising a pesticide carrier and a pesticidally effective amount of a compound selected from the group consisting of 2'-methyl-3'-phenylbenzyl-3-(2-chloro-2-(4-chlorophenyl)-ethenyl)-2,2-dimethylcyclopropanecarboxylate and a compound having the structural formula:



5,066,674

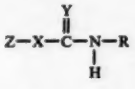
CARBAMATE INHIBITORS OF CHOLESTEROL ESTERASE AND THEIR USE AS HYPOLIPIDEMIC AND HYPOCALORIC AGENTS

Daniel M. Quinn, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Filed Jun. 4, 1990, Ser. No. 533,079
Int. Cl.[5] A61K *31/22*
U.S. Cl. 514—529 10 Claims

1. A method of decreasing the absorption of dietary cholesterol and fats through the wall of the intestinal tract, said method comprising:

administering to a mammal a small but cholesterol esterase inhibiting effective amount of a compound of the formula:



wherein Z equals an aryl moiety selected from the group consisting of 2-naphthyl and p-acetamidophenyl, X and Y are oxygen, and R is a C_1 to C_8 alkyl.

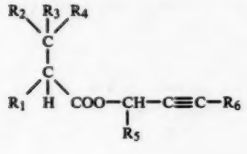
5,066,675

SUBSTITUTED PHENYL ACID ESTERS, THEIR PREPARATION AND THEIR USE AS INSECTICIDES AND ACARICIDES

Ulrich Bühmann; Hartmut Joppien, and Dietrich Baumert, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 403,023, Aug. 31, 1989, abandoned, which is a continuation of Ser. No. 85,973, Aug. 14, 1987, abandoned. This application Aug. 31, 1990, Ser. No. 575,674
Claims priority, application Fed. Rep. of Germany, Aug. 15, 1986, 3627712
Int. Cl.[5] A01N *37/10*
U.S. Cl. 514—544 11 Claims

1. Phenylacetic acid derivatives of general formula I



(I)

in which

R_1 is phenyl, optionally substituted by one or more of the same or different groups selected from halogen, hydroxy, C_{1-4}-alkyl, halo-C_{1-4}-alkyl, C_{3-6}-cycloalkyl, halo-C_{3-6}-cycloalkyl, C_{1-6}-alkoxy, (optionally substituted by halogen, C_{1-4}-alkoxy, C_{1-4}-alkylthio, C_{1-4}-aklylamino or di-C_{1-4}-alkylamino), C_{2-6}-alkynyloxy, halo-C_{2-6}-alkynyloxy, C_{2-6}-alkenyloxy, halo-C_{2-6}-alkenyloxy, C_{3-6}-cycloalkoxy, (optionally substituted by halogen , C_{3-6}-cycloalkylmethoxy, halo-C_{3-6}-cycloalkylmethoxy, C_{1-6}-alkylthio, (optionally substituted by halogen), C_{1-6}-alkylsulphinyl, C_{1-6}-alkylsulphony, phenoxy, halophenoxy, amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, cyano, nitro and the group OX, wherein X is the acyl group R_7CO or the sulphonyl group R_7SO_2, in which R_7 is C_{1-6}-alkyl, (optionally substituted by halogen, C_{1-4}-alkoxy, C_{1-4}-alkylamino or di-C_{1-4}-alkylamino), C_{3-6}-cycloalkyl, (optionally substituted by halogen), C_{2-6}-alkynyl, (optionally substituted by halogen), C_{2-6}-alkenyl or phenyl;

R_2, R_3 and R_4 are the same or different and are C_{1-4}-alkyl, optionally substituted by halogen, C_{2-6}-alkoxy and/or C_{1-4}-alkylthio;

R_5 and R_6 are the same or different and are hydrogen, C_{1-4}-alkyl or C_{3-6}-cycloalkyl, each optionally substituted by halogen, C_{1-4}-alkoxy, C_{1-4}-alkylthio, C_{1-4}-alkylamino or di-C_{1-4}-alkylamino; C_{2-6}-alkenyl or C_{2-6}-alkynyl, each optionally substituted by halogen, or C_{1-6}-alkyl, substituted by the group —OY, wherein Y is hydrogen, the acyl group R_7CO or the sulphonyl group R_7SO_2, in which R_7 has the meaning given above.

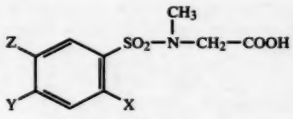
5,066,676

SULFONAMIDO DERIVATIVE INHIBITING THE ALDOSE REDUCTASE ENZYME SYSTEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Giulio Caccia, Viareggio, and Massimo Baldacci, Pisa, both of Italy, assignors to Laboratori Baldacci SpA, Pisa, Italy

Division of Ser. No. 245,165, Sep. 16, 1988, Pat. No. 4,927,849. This application Feb. 8, 1990, Ser. No. 476,762
Claims priority, application Italy, Sep. 16, 1987, 21930 A/87
Int. Cl.[5] A61K *31/19*; C07C *317/14*
U.S. Cl. 514—562 4 Claims

1. A sulfonamido derivative having the general formula:

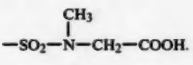


(I)

wherein

X and Y represent alkyl, alkoxy or halogen, and

Z represents the group



4. A method of inhibiting aldose reductase in a patient comprising administering to said patient an amount of said sulfonamido derivative according to claim 1 sufficient to effect said inhibition.

5,066,677

NOVEL OXAMIC ACID COMPOUNDS AND PHARMACEUTICAL COMPOSITION FOR USE IN IMPROVEMENT OF DAMAGED CEREBRAL FUNCTIONS OF BRAIN

Yasuo Sato, Yokohama; Shinsuke Kato, Sendai; Takako Taniguchi; Kunio Atsumi, both of Yokohama; Mitsugu Hachisu, and Seiji Shibahara, both of Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Japan

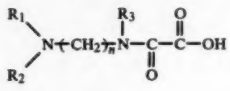
Filed Jul. 6, 1990, Ser. No. 489,358

Claims priority, application Japan, Mar. 8, 1989, 1-53687

Int. Cl.[5] A61K *31/195*

U.S. Cl. 514—563 **3 Claims**

1. A method for protecting against anoxic brain damages in a mammalian animal, which comprises parenterally or orally administering an oxamic acid compound having the formula (I)



(I)

wherein R_1 and R_2 are same or different from each other and are individually a linear or branched alkyl group of 1 to 4 carbon atoms and R_3 is a hydrogen atom or a linear or branched alkyl group of 1 to 4 carbon atoms and n is an integer of 2 to 4, or a pharmacologically acceptable salt thereof, to the animal in an amount sufficient to protect the animal against anoxic brain damage.

5,066,678

PHENETHANDAMINE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Ian F. Skidmore, Welwyn; Lawrence H. C. Lunts, Broxbourne; Harry Finch, Letchworth; Alan Naylor, Royston; Ian B. Campbell, Dane End; Charles Willbe, Bishop's Stortford; William L. Mitchell, London; Stephen Swanson, and Brian D. Judkins, both of Ware, all of England, assignors to Glaxo Group Limited, London, England

Filed Apr. 23, 1990, Ser. No. 512,874

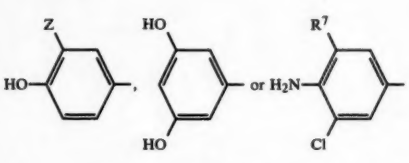
Claims priority, application United Kingdom, Apr. 24, 1989, 8909273

Int. Cl.[5] A61K *31/135;* **C07C** *215/60*

U.S. Cl. 514—597 **28 Claims**

1. A compound of the formula (I)

or a physiologically acceptable salt of solvate thereof; wherein: Y represents a direct bond or a C_{1-6}alkylene group; and A represents a C_{1-6}alkoxy group, with the proviso that the sum total of carbon atoms in Y and A is not less than 5; and W represents a group



wherein Z represents a group $R^3(CH_2)_q$ where q is 0, 1 or 2 and R^3 is a group R^4CONH—, $R^4NHCONH$—, $R^4R^5NSO_2NH$—, R_6SO_2NH— or —OH; R^4 and R^5 each represent a hydrogen atom or a C_{1-3}alkyl group; R^6 represents a C_{1-3}alkyl group; R^7 represents a chlorine atom or the group $—CF_3$.

17. A method of treating a disease associated with reversible airways obstruction which comprises administering to a patient an effective amount to relieve said disease of at least one compound of formula (I) as defined in claim 1 or a physiologically acceptable salt or solvate thereof.

5,066,679

PHENOLIC THIOALKYLAMIDES AS INHIBITORS OF 5-LIPOXYGENASE

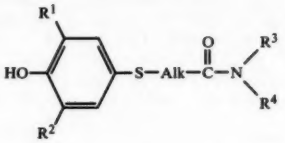
Richard A. Mueller, Glencoe, and Richard A. Partis, Evanston, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 58,431, Jun. 5, 1987, Pat. No. 4,835,189. This application Mar. 9, 1989, Ser. No. 321,034

Int. Cl.[5] A61K *31/65;* **C07C** *323/22*

U.S. Cl. 514—618 **5 Claims**

1. A compound of the formula



or a pharmaceutically acceptable base addition salt thereof; wherein R^1 and R^2 are independently C_4–C_{10} tert-alkyl; Alk is ethylene;

R^3 is

a) benzoylalkyl or

b) phenylalkyl; and

R^4 is:

a) hydrogen or

b) C_1–C_6 alkyl.

5,066,680

SUBSTITUTED-ACETAMIDE COMPOUND AND A PROCESS FOR THE PREPARATION THEREOF

Youichi Shiokawa, Ibaraki; Kazuo Okumura; Kazuhiko Take, both of Osaka, and Kazunori Tsubaki, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

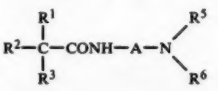
Filed Feb. 5, 1990, Ser. No. 475,301

Claims priority, application United Kingdom, Feb. 14, 1989, 8903253; Apr. 28, 1989, 8909796

Int. Cl.[5] A61K *31/165*

U.S. Cl. 514—622 **9 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of phenyl and phenyl substituted by 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkoxy;

R^2 is selected from the group consisting of phenyl; phenyl substituted by 1 to 3 substituents independently selected from the group consisting of halo, lower alkyl and lower alkoxy; and cyclo(lower)alkyl;

R^3 is hydroxy;

A is lower alkynylene;

R^5 is selected from the group consisting a lower alkyl; hydroxy(lower)alkyl; cyclo(lower)alkyl; phenyl; phenyl(lower)alkyl; and phenyl(lower)alkyl wherein the phenyl ring is substituted by 1 to 3 lower alkoxy substituents; and

R^6 is hydrogen or lower alkyl;

or a pharmaceutically acceptable salt thereof.

5,066,681

1-TRIFLUOROMETHYL-1-NITRO-2-ALKOXY-2-ARYL-ETHANES, THEIR PREPARATION AND ANTIMYCOTIC AGENTS CONTAINING THEM

Bernd Baasner; Gunther Beck; Helmut Heitzer, all of Leverkusen, and Klaus Scaller, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

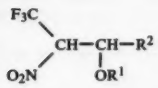
Filed Sep. 20, 1989, Ser. No. 409,909

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1988, 3834326

Int. Cl.[5] C07C *205/31;* A01N *33/20*

U.S. Cl. 514—716 **4 Claims**

1. 1-Trifluoromethyl-1-nitro-2-alkoxy-2-arylethanes of the formula (I)

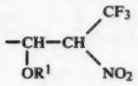


(I)

in which

R^1 represents a straight-chain or branched alkyl radical having 1 to 6 C-atoms and

R^2 represents an unsubstituted phenyl radical or phenyl radical substituted by 1 to 3 halogen atoms, 1 or 2 nitro groups, 1 or 2 alkoxy groups, 1 or 2 CHO groups or a radical of the type



in which

R^1 has the meaning indicated in formula (I), as substituents.

5,066,682

PROCESS FOR PREPARING AN ION EXCHANGE MEMBRANE

Makoto Miyazaki, Iwaki, and Tatsuo Hiyoshi, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1990, Ser. No. 533,400

Claims priority, application Japan, Jun. 5, 1989, 1-140987

Int. Cl.[5] C08J *5/20*

U.S. Cl. 521—27 **19 Claims**

1. A process for preparing an ion exchange membrane comprising the steps of:

(1) providing a membrane of a fluorinated resin containing a pendant precursor ion exchange group represented by the formula:

$$-SO_2X$$

wherein X represents a halogen atom,

said membrane having an equivalent weight of from 600 to 1600 and a thickness of from 100 to 200 μm, and

(2) contacting said membrane having said precursor group with an aqueous solution at a temperature of from 60° to 130° C. for a period of from 20 minutes to 24 hours,

said aqueous solution containing at least one alkali metal or alkaline earth metal hydroxide and at least one water soluble organic compound selected from the group consisting of dimethyl sulfoxide, methanol, ethanol and propanol,

the proportions of the alkali metal or alkaline earth metal hydroxide and the water soluble organic compound in said aqueous solution being, respectively, in the range of from 15 to 50% by weight and in the range of from 0.1 to 30% by weight, based on the weight of said aqueous solution,

thereby hydrolyzing said precursor group of formula $-SO_2X$ to a sulfonate group while causing a membrane volume increase of from 10 to 55%,

said membrane volume increase (ΔV) being defined by the following formula:

$$\Delta V = \frac{b - a}{a} \times 100\ (\%)$$

wherein a represents the volume at 25° C. of the membrane having the precursor group before hydrolysis, and b represents the volume of the membrane after hydrolysis as measured in said aqueous solution at 25° C.

5,066,683

MICROPOROUS WATERPROOF AND MOISTURE VAPOR PERMEABLE STRUCTURES, PROCESSES OF MANUFACTURE AND USEFUL ARTICLES THEREOF

Joseph E. Dillon, and Mark E. Dillon, both of Huntington Valley, Pa., assignors to Tetratec Corporation, Feasterville, Pa.

Continuation-in-part of Ser. No. 389, Jan. 5, 1987, Pat. No. 4,945,125. This application May 1, 1990, Ser. No. 518,435

Int. Cl.[5] C08J *9/40*

U.S. Cl. 521—54 **2 Claims**

1. A microporous film consisting essentially of a matrix of microporous biaxially fibrillated semi-interpenetrating polymer networks of polytetrafluoroethylene and silicone, said matrix having an internal microstructure consisting of nodes interconnected by fibrils, wherein said internal microstructure is coated with a sufficient amount of a hydrophobic material so as to increase resistance to surfactant activity and wherein the hydrophobic material is selected from the group consisting of cured silicone compositions, non-cured silicone compositions and compositions resulting from the curing of a mixture of a curable silicone composition and a non-curable silicone composition.

5,066,684

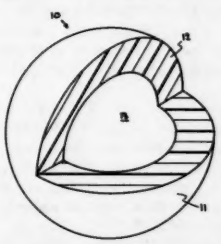
LOW DENSITY MICROCELLULAR FOAMS

James D. LeMay, Castro Valley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 8, 1990, Ser. No. 535,007

Int. Cl.[5] C08J *9/08, 9/28*

U.S. Cl. 521—64 **13 Claims**



1. A process for preparing low density foam material which comprises:

(a) mixing a multifunctional epoxy oligomer resin with a non-reactive diluent to form a resin-diluent mixture;

(b) forming a diluent containing cross-linked epoxy gel from said resin-diluent mixture;

(c) replacing said diluent with a solvent therefore;

(d) replacing said solvent with liquid carbon dioxide; and

(e) vaporizing off said liquid carbon dioxide under supercritical conditions, whereby a foam having a density in the range of 35–150 mg/cc and cell diameters less than about 1 μm is produced.

5,066,685

FIBRE-REINFORCED RIGID POLYURETHANE FOAM AND POLYOL COMPONENT THEREFOR

Pavel Hanak, Thuit Signol, France; Philippe Motte, Media, Pa., and Patrice Gosset, Verneuil en Halatte, France, assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Feb. 22, 1990, Ser. No. 483,605

Claims priority, application United Kingdom, Jul. 3, 1989, 8905206

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—163 30 Claims

1. A polyol composition suitable for use in the production of fiber reinforced rigid polyurethane foams, said composition comprising (a) at least one amino polyol obtainable by reacting an alkylene oxide with an initiator which has a functionality greater than 2, at least one aromatic ring and at least one amino nitrogen atom and (b) at least 3% by weight, based on the total weight of (a) plus (b), of an adduct of a tertiary amine and an alkylene carbonate.

5,066,686

DEODORIZING ODOROUS POLYOLEFINS WITH LOW CONCENTRATIONS OF INORGANIC OXIDIZING AGENTS

Lawrence M. Fodor, and Kenneth W. Willcox, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 16, 1990, Ser. No. 552,956

Int. Cl.[5] A61L *2/16;* C08K *3/38, 3/22, 3/16*

U.S. Cl. 523—102 16 Claims

1. A process for deodorizing odorous aliphatic polyolefins which comprises:

(a) contacting about 0.0001 weight percent to about 0.1 weight percent of inorganic oxidizing agent selected from the group consisting of ammonium perchlorate, potassium perchlorate, sodium perchlorate, sodium chlorate, potassium chlorate, sodium peroxide, sodium peroxyborate, hydrogen peroxide, and mixtures thereof, where the weight percent of inorganic oxidizing agent is based upon the weight of the aliphatic polyolefin; with

(b) said odorous aliphatic polyolefin;

to reduce the odor intensity and neutralize the odor quality of said aliphatic polyolefin.

5,066,687

POWDERED AZO PIGMENTS WITH IMPROVED RHEOLOGICAL PROPERTIES, PROCESS FOR THEIR PREPARATION AND THEIR USE

Wolfgang Rieper, Frankfurt am Main, and Otmar Hafner, Glashütten/Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 380,727, Jul. 13, 1989, abandoned, which is a continuation of Ser. No. 154,456, Feb. 8, 1988, abandoned, which is a continuation of Ser. No. 902,458, Aug. 11, 1986, abandoned. This application May 2, 1990, Ser. No. 526,692

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1984, 3446088; Dec. 18, 1984, 3448044; European Pat. Off., Dec. 12, 1985, PCT/EP85/00699

Int. Cl.[5] C08K *9/04;* B32B *5/16*

U.S. Cl. 523—205 12 Claims

1. A powdered azo pigment with improved rheological properties for use in paint system on an alkyd/melamine, acrylic/melamine, acrylate/isocyanate or polyester/isocyanate basis both of the conventional nature and of a modern nature of the "high solids type", comprising coated azo pigment,

the surface of the base azo pigment having been coated with 1 to 20% by weight of an active substance consisting of a paint additive of the polyurethane series, said paint additive prepared by reacting polyisocyanurates which carry free isocyanate groups, said groups being provided by toluylene diisocyanates, hexamethylene diisocyanate or mixtures thereof

with each of the following reactants (1) aliphatic mono- or polyhydroxycarboxylic acid C_1–C_{20}-alkyl esters (degree of polycondensation 2–50) (2) polyethylene glycols having average molecular weight of 500–1500 and (3) 5- or 6-membered, saturated or unsaturated heterocyclic compounds which contain at least one nitrogen atom in the ring and contain reactive amino or hydroxy-C_1–C_6- alkyl groups, in such a quantity that the reactants react with said free isocyanate groups until isocyanate groups are no longer detectable,

the azo pigment is coated by mixing in the form of a dispersion of the base azo pigment in water or in an organic solvent or in a mixture of water and an organic solvent, while stirring, with a solution of the said active substance

in an organic solvent which is insoluble or not infinitely soluble in water, or

in an organic solvent which is at least partially water-miscible, or

in an aliphatic carboxylic acid of 1 to 4 carbon atoms,

and subsequently distilling off any organic solvent which may be present except for said aliphatic carboxylic acid of 1–4 carbon atoms, and the water, if present, remains.

5,066,688

CATHODIC ELECTRODEPOSITION COATINGS CONTAINING A REACTIVE ADDITIVE

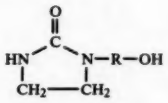
Ding Y. Chung, Rochester Hills; Tapan K. Debroy, Shelby Township, Macomb County, and Sioe-Heng A. Tjoe, Troy, all of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1991, Ser. No. 683,051

Int. Cl.[5] C08G *59/40;* C09D *5/44*

U.S. Cl. 523—415 10 Claims

1. In a cathodic electrocoating composition, comprising an aqueous carrier having dispersed therein a film forming binder comprising an epoxy-amine adduct and a blocked polyisocyanate crosslinking agent; wherein the improvement comprises a reactive additive of the formula



wherein R is an aliphatic hydrocarbon group.

5,066,689

AQUEOUS COATING MATERIAL METHOD FOR ITS PREPARATION AND ITS USE FOR ELECTROPHORETIC COATING

Hans-Peter Patzschke, and Armin Goebel, both of Wuppertal, Fed. Rep. of Germany, assignors to Herberts GmbH, Wuppertal, Fed. Rep. of Germany

Continuation of Ser. No. 180,482, Apr. 12, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 574,544

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712805

Int. Cl.[5] C08L *63/00;* C09D *5/44;* C25D *13/00*

U.S. Cl. 523—415 9 Claims

1. An aqueous coating material which contains an organic synthetic resin binding agent and which can be diluted with water after protonization with acids, comprising a synthetic resin component and a crosslinking agent, wherein the organic synthetic resin binding agent comprises

(i) from about 40 to about 95% by weight of an amino epoxide synthetic resin containing at least one primary amino moiety and at least one urea moiety per molecule, said amino epoxide resin being the product of

(a) the defunctionalization of a polyepoxide resin by reac-

tion with monofunctional alkyl or alkylaryl compounds of the formula R—X—H, in which X is —O—, —S—, —NR—, —CONH—, or —COO—, and R is a linear, branched, cyclic, saturated or unsaturated C_{2-20} alkyl moiety which optionally contains ether bonds in the chain or in the ring, and/or is substituted by hydroxyl groups and/or C_{1-4} alkoxy moieties, or said R is an aryl moiety which is substituted by from one to three of said C_{2-20} alkyl moiety in an amount whereby 0.5 to 1.2 epoxide groups per molecule remain free;

(b) followed by a reaction with excess polyamine containing no other functional groups than optional secondary amino groups which are reactive with epoxy group;

(c) then a reaction of from about 40% to about 90% by weight of the modified epoxy resin/polyamine adduct obtained in step (b), with an aldehyde or ketone in such an amount that the ratio of primary amino groups to aldehydes or ketones if from about 1:1.1 to about 1:5, to form an imine,

(d) then a reaction of said imine with from about 10 to about 60% by weight of polyisocyanates, wherein the weight percentages of said imine and of the polyisocyanates add up to 100%; and

(e) then hydrolysis of the aldimine or ketimine groups of the imine by additional water;

(ii) said synthetic resin having at least one primary amino and one secondary amino group and from about two to about six hydroxyl groups in the molecule;

(iii) said crosslinking agent is from about 5% to about 60% by weight of a compound reactive with amino and/or hydroxyl groups.

5,066,690

COATING RESIN COMPOSITION BASED ON EPOXY POLYOL ESTERS OF UNSATURATED FATTY ACIDS

Roger A. Schmidt, Chanhassen, and Bryan R. Swenson, Monticello, both of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 324,193, Mar. 16, 1989, abandoned. This application Jul. 3, 1990, Ser. No. 547,372

Int. Cl.[5] C09D *3/58;* **C08L** *63/00*

U.S. Cl. 523—423 **14 Claims**

1. A polymeric vehicle which is suitable for neutralization with a base to provide a water dispersible polymeric vehicle for a formulated coating, the polymeric vehicle comprising:

a reaction product of from about 25 to about 90 parts by weight based upon the weight of solids of the polymeric vehicle of an epoxy polyol ester resin and from about 10 to about 75 parts by weight based upon the weight of solids of the polymeric vehicle of a blend of two or more unsaturated monomers each monomer having polymerizable double bonds;

the epoxy polyol ester resin comprising a reaction product of from about 10 to about 65 parts by weight based upon the weight of solids of the epoxy polyol ester resin of an epoxy resin having an epoxy functionality of from about 1.8 to 2.5 and an average epoxy equivalent weight of from about 150 to about 800, from about 1 to about 30 parts by weight based upon the weight of solids of the epoxy polyol ester resin of a polyol having at least three hydroxy groups and a molecular weight of at least about 120, and from about 25 to about 85 parts by weight based upon the weight of solids of the epoxy polyol ester resin of an unsaturated partially conjugated fatty acid having from 16 to 20 carbon atoms having double bonds of which from about 20 to about 50 percent are conjugated, the epoxy resin, the polyol and the partially conjugated fatty acid ester being reacted together in a reaction mixture which includes all three reactants; and

the blend of unsaturated monomers comprising an unsaturated monobasic acid and at least a second monomer, the unsaturated monobasic acid monomer being in effective amount to bring the acid value of the polymeric vehicle in the range of from about 15 to about 100.

5,066,691

ADHESIVE COMPOSITION FOR METAL-CLAD LAMINATES

Toshihisa Kumakura; Ken Nansaumi; Ryoichi Ikezawa, and Hideki Eriguchi, all of Shimodate, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,637

Claims priority, application Japan, Dec. 5, 1988, 63-307617

Int. Cl.[5] C08K *3/22;* **C08L** *29/04*

U.S. Cl. 523—438 **4 Claims**

2. An adhesive composition for metal-clad laminates which consists essentially of:

(a) 100 parts by weight of a polyvinylbutyral having an average polymerization degree of from 500 to 3,000 and a degree of butyralization of at least 60 mol %,

(b) from 10 to 200 parts by weight of an epoxidized polybutadiene per 100 parts by weight of the polyvinylbutyral, the epoxidized polybutadiene having a number average molecular weight of from 1,000 to 10,000 and an epoxy equivalent weight of from 200 to 2,000,

(c) from 1 to 10 parts by weight of a hardener for the epoxidized polybutadiene per 100 parts by weight of the epoxidized polybutadiene, and

(d) from 10 to 200 parts by weight of aluminum hydroxide having an average particle size of from 0.1 to 10 μm as a filler.

5,066,692

ELECTROMAGNETIC WAVE SHIELDING COMPOSITION COMPRISING EPOXY RESIN AND COPPER PARTICLES

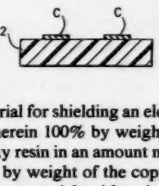
Yamahiro Isawa; Isao Morooka, both of Hachioji, and Yoichi Oba, Higasiyamato, all of Japan, assignors to Asahi Chemical Research Laboratory Co., Ltd., Tokyo, Japan

Division of Ser. No. 313,083, Feb. 21, 1989, Pat. No. 4,970,354. This application Jun. 21, 1990, Ser. No. 541,826

Claims priority, application Japan, Feb. 21, 1988, 63-37798

Int. Cl.[5] C08K *5/00;* **C08L** *63/00;* **G21F** *1/10*

U.S. Cl. 523—458 **2 Claims**



1. A coating material for shielding an electromagnetic waves having contained therein 100% by weight of copper particles and a binder of epoxy resin in an amount not less than 12% and not more than 25% by weight of the copper particles so as to provide the coating material with substantial capacity for adherence to base material and for ease of plating deposition.

5,066,693

MOLDING COMPOSITIONS OF RESOLE PHENOLIC RESIN AND EPOXY RESIN

Manoj K. Gupta, Southfield, Mich., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 244,192, Sep. 14, 1988, Pat. No. 5,015,529, which is a continuation-in-part of Ser. No. 946,350, Dec. 24, 1986, abandoned. This application Feb. 12, 1990, Ser. No. 478,894

Int. Cl.[5] C08L *61/10;* **C08K** *03/34, 03/40*

U.S. Cl. 523—466 **12 Claims**

1. A molding composition comprising in percent by weight based on the total composition,

1) about 20 to about 60 percent resole phenolic resin,

2) about 0.1 to about 15 percent of a curing agent selected

from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides and mixtures thereof.

3) about 5 to about 60 percent of a filler other than fiber reinforcement which is chemically different from said curing agent, and

4) an epoxy resin, wherein the epoxy resin is present in a proportion of about 5 to about 25 weight percent of epoxy resin based on the total weight of resole phenolic resin and epoxy resin.

5,066,694

NOVEL PRESSURE SENSITIVE ADHESIVE COMPOSITIONS (C-2511)

Pawan K. Agarwal, Bridgewater, N.J., and Thomas Pugel, Riegelsville, Pa., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 491,403, Mar. 9, 1990, abandoned, which is a continuation of Ser. No. 287,421, Dec. 21, 1988, abandoned. This application Sep. 27, 1990, Ser. No. 589,296

Int. Cl.[5] C08L *95/00;* **C08K** *5/09*

U.S. Cl. 524—60 **5 Claims**

1. A pressure sensitive adhesive emulsion system which comprises:

(a) an emulsion of a metal or amine neutralized sulfonated copolymer of a conjugated diene of from 4 to 12 carbon atoms and styrene sulfonate, said metal or amine neutralized sulfonated copolymer having a out 5 to about 250 meq. of neutralized sulfonated groups per 100 grams of said neutralized sulfonated copolymer, wherein aid neutralized sulfonated copolymer has at least 80% by weight of said conjugated diene;

(b) about 1 to about 75 parts by weight (dry basis) of an emulsion of a preferential plasticizer per 100 parts by weight of the neutralized sulfonated copolymer, the plasticizer being selected from the group consisting of a fatty acid or a metal salt of a fatty acid, wherein said fatty acid has about 5 to about 30 carbon atoms and the metal cation is selected from the group consisting of Groups IA, IIA, IB and IIB of the Periodic Table of the Elements; and

(c) about 25 to about 300 parts by weight (dry basis) of an emulsion of a hydrocarbon tackifying resin based on a petroleum or coal tar distillate over 100 parts by weight of said neutralized sulfonated copolymer.

5,066,695

HIGH-MOLECULAR WEIGHT ORGANIC MATERIAL CONTAINING A METAL COMPLEX PIGMENT BASAED ON HYDRAZONE

Georg Cseh, Posat; Paul Lienhard, Frenkendorf, and Walter Wiedemann, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

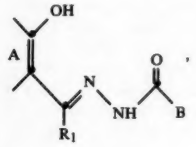
Filed Jun. 29, 1989, Ser. No. 374,321

Claims priority, application Switzerland, Jul. 1, 1988, 2514/88

Int. Cl.[5] C08K *5/34*

U.S. Cl. 524—87 **9 Claims**

1. High-molecular weight organic material containing at least one metal complex of a ligand of formula I:



(I)

wherein A is a carbocyclic aromatic or heterocyclic aromatic radical, B is a carbocyclic aromatic radical or a heterocyclic aromatic radical containing at least one N atom, it being necessary for at least one of the radicals A and B to be heterocyclic, and R_1 is —C_1–C_{18}-alkyl, a carbocyclic aromatic radical or a heterocyclic aromatic radical containing at least one N atom, and the metal is a transition metal cation carrying a double positive charge selected from Ni^{2+}, Cu^{2+}, Co^{2+}, Zn^{2+}, Mn^{2+}, Fe^{2+}, Cd^{2+} or Pt^{2+} or the radical VO^{2+}.

5,066,696

POLYMERS STABILIZED AGAINST LIGHT AND HEAT DEGRADATION

Newman M. Bortnick, Oreland; Robert A. Wanat, Langhorne, and Darnel Degraff, Bensalem, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 12, 1990, Ser. No. 478,807

Int. Cl.[5] C08K *5/0492*

U.S. Cl. 524—91 **38 Claims**

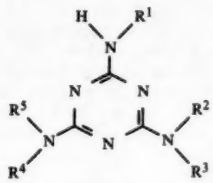
1. A polymer composition stabilized against heat and/or light selected from the group consisting of a polymers of:

a) one or more (meth)acrylic esters and acids;

b) a vinyl halide; or

c) blends of the above polymers;

and an effective stabilizing amount of a tertiary-alkyl-substituted melamine having the formula



where R^1 is a C_4–C_{18} tertiary alkyl and R^2–R^5 are selected from the same or different C_1–C_{18} straight- or branched-chain alkyls and hydrogen.

5,066,697

POLYBENZIMIDAZOLE SOLUTIONS

Robert B. Sandor, Charlotte, and Theodore S. Thornburg, Harrisburg, both of N.C., assignors to Hoechst Celanese Corporation, Charlotte, N.C.

Filed Jun. 8, 1990, Ser. No. 537,469

Int. Cl.[5] C08K *5/04*

U.S. Cl. 524—233 **9 Claims**

1. A solution of polybenzimidazole, the solution being resistant to phase separations, comprising:

a polybenzimidazole;

a solvent capable of dissolving said polybenzimidazole; and

a minor amount of ammonium acetate.

5,066,698

COATING COMPOSITION OF AN ACRYLIC POLYMER, A CROSSLINKING AGENT AND A SILANE OLIGOMER

Isidor Hazan, Clementon, N.J., and John D. Nordstrom, Detroit, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 10, 1990, Ser. No. 521,556

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—269 **12 Claims**

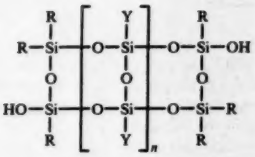
1. A high solids coating composition comprising about 40–80% by weight of a binder and correspondingly about 20–60% by of a liquid organic carrier; wherein the binder consist essentially of about:

a. 15–70% by weight, based on the weight of the binder, of an acrylic polymer being in solution consisting essentially of polymerized monomers of ethylenically unsaturated esters of acrylic acid or methacrylic acid and a hydroxy alkyl acrylate or methacrylic and the polymer has a hydroxyl no. of about 50–200 and a weight average molecular weight of about 4,000–20,000;

b. 5–25% by weight, based on the weight of the polymer, of

a dispersed polymer of polymerized monomers comprising stabilizer resin segment that is soluble in the organic carrier and dispersed resin segment that is relatively insoluble in the organic carrier;

c. 10–40% by weight, based on the weight of the binder, of a siloxane oligomer having the following structural formula:



where n is 0–10, R is an alkyl group having 1–6 carbon atoms or an aryl group and Y is either R or —OH and the oligomer has a hydroxyl content of about 3–10% by weight and a weight average molecular weight of about 500–5000; and

d. 15–40% by weight, based on the weight of the binder, of an alkylated melamine formaldehyde resin.

5,066,699

STORAGE STABLE HEAT CURABLE ORGANOSILOXANE COMPOSITIONS CONTAINING A MICROENCAPSULATED CATALYST AND METHOD FOR PREPARING SAID CATALYST

Chi-Long Lee, and Ming-Hsiung Yeh, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1990, Ser. No. 575,780
Int. Cl.[5] C08K 5/05
U.S. Cl. 524—379 **11 Claims**

1. In an improved one-part, storage stable, heat curable organosiloxane composition comprising

A. a liquid or gum type curable polyorganosiloxane containing at least two of a first reactive group;

B. a curing agent for said composition selected from organosilicon compounds containing at least two of a second reactive group that reacts with said first reactive group to yield a cured material, where

said first reactive group is a silicon-bonded hydroxyl group or silicon-bonded terminally unsaturated alkenyl radical,

said second reactive group is silicon-bonded hydrogen when said first reactive group is silicon-bonded hydroxyl or silicon-bonded alkenyl, or said second reactive group is silicon-bonded alkoxy only when said first reactive group is silicon-bonded hydroxyl,

the concentration of said curing agent relative to said curable polyorganosiloxane (A) is sufficient to cure said composition in the presence of a curing catalyst, and

the sum of the average number of said first reactive groups per molecule of said polyorganosiloxane (A) and the average number of said second reactive groups per molecule of said curing agent (B) is greater than 4,

C. an amount of a liquid or solubilized curing catalyst sufficient to promote curing of said composition, where said catalyst is microencapsulated within a matrix or layer of a solid organic polymer derived from an ethylenically unsaturated organic compound,

the improvement comprising preparing said microencapsulated curing catalyst by

(1) forming a solution comprising

(a) a precursor for said organic polymer selected from that polymerize in the presence of ultraviolet light, where said precursor is a hydroxyl-containing ethylenically unsaturated organic compound selected from the group consisting of vinyl esters of carboxylic acids, hydroxyl-containing ethylenically unsaturated carboxylic acids, esters of said ethylenically unsaturated carboxylic acids, and esters derived from an ethylenically unsaturated carboxylic acid and an alcohol containing at least two hydroxyl groups per molecule,

(b) a photoinitiator in an amount sufficient to initiate polymerization of said precursor in the presence of ultraviolet light to form said organic polymer,

(c) said curing catalyst in the form of a solubilized coordination complex of a metal with either (i) an ethylenically or acetylenically unsaturated organic compound or (ii) the residue remaining following removal of the hydrogen atom from the carboxyl group of a carboxylic acid, said metal being selected from the group consisting of platinum group metals and titanium, and

(d) a solvent selected from the group consisting of mono- and polyhydric alcohol

(2) irradiating said solution with an amount of ultraviolet light sufficient to polymerize said precursor to form the organic polymer portion of said microencapsulated catalyst, where said microencapsulated catalyst is formed as a dispersion of solid particles in said solution, a majority of said particles are less than one micron in diameter and substantially none exceed three microns in diameter.

5,066,700

PLASTOELASTOMERIC POLYOLEFINIC COMPOSITIONS AND PROCESS FOR PREPARING THEM ACCORDING TO DYNAMIC VULCANIZABLE METHODS

Vittorio Braga; Michele Manica, both of Ferrara; Emilio Martini, Pontecchio Marconi, and Federico Milani, Maria Maddalena, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

Division of Ser. No. 406,971, Sep. 13, 1989, Pat. No. 4,963,612.
This application May 29, 1990, Ser. No. 529,488
Claims priority, application Italy, Sep. 13, 1988, 21906 A/88
Int. Cl.[5] C08C 5/05
U.S. Cl. 524—380 **5 Claims**

1. A process for preparing the plastoelastomeric polyolefinic compositions comprising an intimate mixture of the following components, in the indicated percentage by weight:

A) 10–50% of non cross-linked polypropylene,

B) 2–10% of an ethylene/propylene elastomeric non cross-linked copolymer, or of an ethylene/propylene/diene elastomeric non cross-linked terpolymer,

C) 30–45% of a polymeric product insoluble in xylene at 135° C., comprising polypropylene and ethylene/propylene copolymer or ethylene/propylene/diene terpolymer, and

D) 5–58% of an extender oil, which comprises the following consecutive steps:

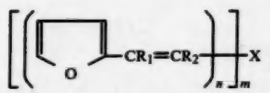
1) preparing an intimate mixture comprising, in % by weight of the whole mixture:

(a) from 20 to 80% of polypropylene or of a copolymer of propylene with up to 10% by weight of ethylene;

(b) from 80 to 20% of an ethylene/propylene elastomeric copolymer or of an ethylene/propylene/diene elastomeric terpolymer;

(c) from 0.1 to 10%, referred to the elastomeric copolymer or terpolymer, of an organic peroxide as a vulcanizing agent;

(d) from 5 to 60% referred to the organic peroxide, of at least one compound selected from the group consisting of the following formulae:

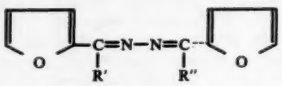


(I)

where: X is a radical of formula: —CHO, —COOH, —$CONH_2$, —CN, —NO_2, —COOCO—, —COOR, —CO—, —CH_2COCH_2COOR, $CH(COOR)_2$, where R

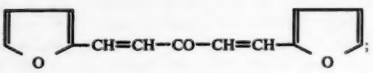
is an aryl containing 6 to 8 carbon atoms or an alkyl containing 1 to 4 carbon atoms, R_1, and R_2, which are equal to, or different from each other, can be H or C_1–C_3 alkyl, n=1 or 2, and m=a number equal to the free valence of X;

(II)

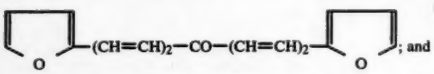


where R′ and R″, which are equal to or different from each other, may be hydrogen, or alkyl radicals containing 1 to 4 carbon atoms, or cycloalkyl radicals containing from 5 to 8 carbon atoms;

(III)

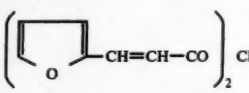


(IV)



; and

(V)



(e) an amount from 0 to lower than 4%, based on the total polymeric material, of polyethylene;

2) heating the mixture during mixing, or mastication, or while the mixture is subjected to other shearing stresses to a temperature ranging from 160° C. to 240° C. such that melting of polypropylene and cross-linking of about 50–85% by weight of the originally present elastomeric copolymer or terpolymer occurs; and

3) adding to the resulting product, by means of intimate mixing, an extender oil in an amount ranging from 6 to 100 parts by weight of the product.

5,066,701

STABILIZED POLYKETONE POLYMERS

Eric R. George, and Lynn H. Slaugh, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1990, Ser. No. 610,286

Int. Cl.[5] C08K *3/32, 3/10*

U.S. Cl. 524—417 **22 Claims**

1. A stabilized polymer composition comprising:

a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon; and

a mixture of a hydroxyapatite and a zinc aluminate, wherein the mixture is present in the composition in a stabilizing amount.

5,066,702

RUBBER COMPOSITION FOR TIRE TREADS

Hirofumi Hayashi, Ibaraki, and Yo Matsumoto, Itami, both of Japan, assignors to Toyo Tire & Rubber Company, Limited, Osaka, Japan

Filed Apr. 12, 1990, Ser. No. 508,196

Claims priority, application Japan, Apr. 13, 1989, 1-93881

Int. Cl.[5] B60C *11/14;* **C08K** *3/20, 3/26;* **C08L** *9/00*

U.S. Cl. 524—426 **4 Claims**

1. A tire tread rubber composition comprising a diene rubber hand filler, and at least one of silica and carbon black, the composition being characterized in that the amount of extract (E), as defined below, satisfies the equation (1) and that at least one hard filler is selected from the group consisting of alumina, granite, quartz and limestone, said hard filler being 0.01 to 5 mm in mean particle size and at least 100 kg/mm^2 in Knoop hardness, said hard filler being used in an amount of 3 to 80 parts by weight per 100 parts by weight of the rubber component resulting from the subjection to extraction with acetone/-chloroform of the vulcanized composition, wherein said equation is

$$E<0.4\,(A-38) \qquad (1)$$

and wherein:

E represents the amount in parts by weight of the acetone/-chloroform extract per 100 parts by weight of the rubber component of the vulcanized composition which has been subjected to the extraction, and

A represents the sum of the amount in parts by weight of carbon black and one-half of the amount in parts by weight of silica per 100 parts by weight of the rubber component, as determined for the vulcanized composition which has been subjected to the extraction, wherein at least one of silica and carbon black is added in an amount of 30 to 80 parts by weight per 100 parts by weight of the rubber component prior to vulcanization.

5,066,703

TRANSPARENT COATING FOR RUBBER ARTICLES

George M. Hart, Adrian, and Mark E. Hayford, Blissfield, both of Mich., assignors to Wacker Silicones Corporation, Adrian, Mich.

Continuation of Ser. No. 285,174, Dec. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 245,486, Sep. 19, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 515,534

Int. Cl.[5] C08K *3/10*

U.S. Cl. 524—437 **13 Claims**

1. A composition for applying to an outer surface of a rubber tire prior to vulcanization, which when vulcanized forms a transparent coating thereon comprising (A) from 1 to 80 percent by weight based on the weight of the composition of a preformed latex selected from the class consisting of natural rubber and synthetic polymers obtained from the in situ polymerization of emulsified monomers, said synthetic polymers are selected from the class consisting of homopolymers of the conjugated diense and monomers having monoethylenic unsaturation selected from the class consisting of sytrene, substituted sytrenes, and vinyl pyridine, (B) from 0.01 to 20 percent by weight of the composition of an emulsifying agent selected from the class consisting of anionic and nonionic emulsifying agents, (C) from 2 to 80 percent by weight of the composition of a filler consisting of an inorganic fluoro-containing compound having a refractive index in the range of from 1.32 to 1.49, which is selected from the group consisting of an alkali metal fluoro compound, an alkaline earth metal fluoro compound, aluminum fluoride and sodium fluoaluminate, (D) from 0.01 to 10 percent by weight based on the weight of the composition of a thickening agent, selected from the class consisting of synthetic gums, water soluble polysaccharides, polyacrylic acids and mixtures thereof and (G) from 20 to 85 percent by weight of water based on the weight of the composition.

5,066,704

FILLED THERMOPLASTS WITH LOW SHRINKAGE ANISOTROPY

Wolfgang Wehnert, Krefeld; Klaus Reinking, Wermelskirchen, both of Fed. Rep. of Germany; Peter Bier, Coraopolis, Pa.; Klaus Kraft, and Erhard Tresper, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 303,154, Jan. 27, 1989, abandoned. This application May 21, 1990, Ser. No. 526,388

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803475

Int. Cl.[5] C08F *2/16*

U.S. Cl. 524—449 **13 Claims**

1. A mixture comprising:

A) from 20 to 80% by weight of polyarylene sulphide,

B) from 10 to 60% weight of glass fibers and

C) from 60 to 10% by weight, of commercial mica MICRO MICA Wl ® which is Norwegian talc containing about 91% by weight of particles smaller than 10 μm, the percentages by weight being based on the sum of the weight of components A+B+C.

5,066,705

AMBIENT CURE PROTECTIVE COATINGS FOR PLASTIC SUBSTRATES

Frank A. Wickert, Olmsted Township, Cuyahoga County, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Jan. 17, 1990, Ser. No. 466,679

Int. Cl.[5] C08G *18/72*

U.S. Cl. 524—457 **12 Claims**

1. An aqueous dispersed, thermosetting, protective coating composition for application to a plastic substrate, the coating composition containing a thermosetting polymeric binder comprising on a volume solids basis:

between 50% and 80% an emulsion copolymer comprising copolymerized ethylenically unsaturated monomers including a carboxyl functional monomer, said emulsion copolymer having an Acid No. between 20 and 100, and between 20% and 50% of a water-dispersed carboxyl functional polyurethane having an Acid No. between 20 and 100; and

from 2% to 10% volume solids of polycarbodiimide based on the volume solids of said emulsion copolymer and said polyurethane.

5,066,706

PROCESS FOR PREPARING A LATEX BASED ON POLYPYRROLE AND USE OF THIS LATEX TO FORM A CONDUCTING FILM

Elise Destryker, Sint-Pieters-Leeuw, and Etienne Hannecart, Tervueren, both of Belgium, assignors to Solvay & Cie (Société Anonyme), Brussels, Belgium

Filed Mar. 6, 1989, Ser. No. 319,314

Claims priority, application France, Mar. 21, 1988, 88 03778

Int. Cl.[5] C08F *2/16*

U.S. Cl. 524—459 **16 Claims**

1. A process for preparing a latex based on pyrrole or a pyrrole derivative, the latex forming an electrically conductive film upon drying, comprising the following operations:

1) in a first stage, water a ferric salt, a polyvinyl alcohol or derivative of this alcohol and a codispersant agent are introduced into a reactor, to form a reaction medium, wherein said codispersant is an organic compound capable of giving rise to anions selected from the group consisting of alkyl sulphates, aryl sulphates, alkyl sulphonates and aryl sulphonates, and

2) in a second stage, pyrrole or the pyrrole derivative is added to the reaction medium in the presence of water.

5,066,707

COMPOSITION

Linda H. Nelson, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 19, 1989, Ser. No. 452,480

Int. Cl.[5] C08K *5/01*

U.S. Cl. 524—490 **7 Claims**

1. A composition comprising a resin of

(a) about 10 to 90 weight percent of a mixture of acrylonitrile or methylmethacrylate and styrene or alpha-methyl styrene wherein the acrylonitrile is from about 10 to 50 weight percent of the reactant mixture and the styrene and/or alpha-methyl styrene is from about 50 to 90 weight percent of the reactant mixture and

(b) about 90 to 10 weight percent of polybutadiene or polyisoprene wherein up to 50 weight of the polybutadiene or polyisoprene is replaceable by a styrene or alpha-methylstyrene,

in admixture with a mold release effective amount of a fluid hydrogenated oligomer of an alpha olefin with the proviso that polyvinylchoride is absent from the composition.

5,066,708

NOVEL DAMPING COMPOSITIONS

Robert D. Koller, Sr., Valbonne, France, and Carl P. Hemenway, Glenside, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 336,187, Apr. 11, 1989, Pat. No. 5,008,324. This application Jan. 10, 1991, Ser. No. 639,622

Int. Cl.[5] C08K *3/04*; C08L *51/00*; F16F *1/36, 7/12*

U.S. Cl. 524—504 **4 Claims**

1. A process for damping comprising:

a) preparing in emulsion a multi-phase, thermoplastic elastomeric polymer having at least two polymeric phases comprising:

i) an initial linear or lightly crosslinked polymeric phase polymerized from an alpha,beta-ethylenically unsaturated monomer, wherein said alpha, beta-ethylenically unsaturated monomer comprises from 0 to about two percent by weight of multi-ethylenically unsaturated monomer,

ii) a second polymeric phase in the form of discrete domains of about 2 to about 50 nanometers in diameter dispersed within said initial polymeric phase, wherein said second polymeric phase is polymerized from at least one ethylenically unsaturated monomer comprised of about 5 percent to 100 percent by weight multifunctional monomer having at least two sites of ethylenic unsaturation,

wherein the weight ratio of said second polymeric phase to said initial polymeric phase plus said second polymeric phase is from about 1:100 to about 1:2;

b) isolating said multi-phase polymer in solid form;

c) processing said solid multi-phase polymer into a shaped object;

d) placing said shaped object between two surfaces, at least one of which is subject to vibrations, and damping said vibrations.

5,066,709

BIOADHESIVE COMPOSITION

Ratan K. Chaudhuri, Butler; Rama K. Haldar, Randolph, and Balgopal Gangadharan, Caldwell, all of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.

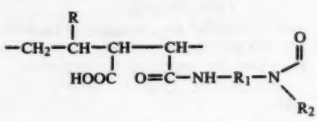
Filed Sep. 20, 1990, Ser. No. 585,326

Int. Cl.[5] C08L *39/00*

U.S. Cl. 524—516 **13 Claims**

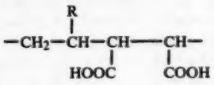
1. A bioadhesive composition comprising a non-toxic carrier and a polymer comprising between about 45 and about 70 weight % of units having the structure

A.



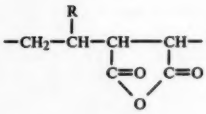
between about 50 and about 30 weight % of units having the structure

B.



and/or

C.



and 2 to 7 weight % of an amine salt containing a lactam functionality derived from A and/or B, wherein R is hydrogen, alkoxy, phenyl, carboxyl or —N lactam having from to 6 carbon atoms; R_1 is C_1 to C_6 alkylene and R_2 is C_2 to C_4 alkylene; said copolymer having a number average molecular weight of about 40,000 to about 500,000 and a relatively small particle size.

5,066,710

THICKENING AGENT WHICH MODIFIES THE RHEOLOGICAL CHARACTERISTICS OF CHARGED AND/OR PIGMENTED, WHITE OR COLORED AQUEOUS COMPOSITIONS

Benoit Simonet, Lozanne; Pierre Fabre, Collonges-Au-Mont-D'Or; Jacques Laluet, Lyons, and Jean-Bernard Egraz, Ecully, all of France, assignors to Coatex, S.A., Caluire, France

Division of Ser. No. 376,126, Jul. 6, 1989. This application Mar. 15, 1990, Ser. No. 493,793

Claims priority, application France, Jul. 7, 1988, 88 09509

Int. Cl.[5] C08L *39/00*

U.S. Cl. 524—555 **4 Claims**

1. An aqueous composition, comprising:

(i) as principle components, an aqueous phase of at least one pigment, a natural or synthetic binding agent and from 0.1 to 10% by dry weight in relation to the total weight of the aqueous composition, of an associative thickening copolymer composed of:

(a) at least one monomer having an ethylenic site of unsaturation and at least one carboxylic acid functional group;

(b) at least one monomer having an ethylenic site of unsaturation and no carboxylic acid functional group; and

(c) at least one surfactant monomer having at least one urethane functional group resulting from the reaction of an isocyanate compound containing an ethylenic site of unsaturation with a surfactant compound containing a hydroxyl function which is reactive to the isocyanate group of the isocyanate compound, wherein said copolymer, when placed in an aqueous solution with 2% by weight of active thickener and brought to a pH of 9 by the addition of ammonia, at a temperature of 20° C., has a Brookfield viscosity at 100 revolutions per minute of at most equal to 220 centipoises; and

(ii) secondary components of (1) a dispersing agent and (2) at least one member selected from the group consisting of coalescing agents, biocidal agents, tensio-active agents and antifoaming agents.

5,066,711

WETNESS INDICATING HOT-MELT ADHESIVES

Herman Colon, Monsey, N.Y., and Albert Maletsky, Franklin Lakes, N.J., assignors to The International Group, Inc., Lyndhurst, N.J.

Continuation of Ser. No. 209,404, Jun. 20, 1988, Pat. No. 4,895,567, which is a continuation-in-part of Ser. No. 178,662, Apr. 7, 1988, abandoned, which is a continuation of Ser. No. 70,206, Jul. 14, 1987, Pat. No. 4,743,238, which is a continuation-in-part of Ser. No. 839,943, Mar. 17, 1986, Pat. No. 4,681,576. This application Nov. 15, 1989, Ser. No. 437,471

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] C08J *23/00;* **C08L** *31/00, 91/08*

U.S. Cl. 524—556 **10 Claims**

1. A wetness indicating hot-melt adhesive composition comprising

(A) at least one polymer selected from the group consisting of ethylene/vinyl acetate copolymer and ethylene/acrylic acid copolymer;

(B) an acidic material

(C) 0 to 40 wt. % of water soluble wax;

(D) 0 to 60 wt. % of glycerol monostearate;

(E) 0 to 55 wt. % of hydrogenated castor oil;

(F) 0 to 15 wt. % of polyalkylene wax;

(G) 0 to 60 wt. % of compatible plasticizer;

(H) particles of a dyestuff insoluble in the composition but soluble in water, the color of the dyestuff particles being substantially invisible in the composition, whereby when the composition is wet with water the dyestuff particles dissolve in the water and permeate the composition, and

(I) a surfactant.

5,066,712

EMULSION COPOLYMERIZATION

Ian D. Lewis, Cheam, England, assignor to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Continuation of Ser. No. 192,023, May 9, 1988, abandoned. This application Jul. 3, 1989, Ser. No. 374,587

Claims priority, application United Kingdom, May 8, 1987, 8710912

Int. Cl.[5] C08L *27/06, 31/04, 83/06;* **C08J** *3/03*

U.S. Cl. 524—563 **7 Claims**

1. A process of preparing a vinyl copolymer emulsion wherein

i) the monomer components are reacted under pressure emulsion polymerization conditions from about 20 bar to about 100 bar in the presence of a surfactant including C14 to C20 alkenylene moiety to provide an emulsion of vinyl polymer particles with a surface capable of reacting with an expoxy moiety and

ii) the emulsion is reacted chemically with from about 0.1% to about 3% by weight of an epoxy silane material.

5,066,713

PROCESS FOR THE PREPARATION OF AQUEOUS, RADIATION-CURABLE URETHANEACRYLATE DISPERSIONS

Werner Flakus, Recklinghausen, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 2, 1990, Ser. No. 502,692

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916340

Int. Cl.[5] C08G *18/08, 18/67;* **C09D** *175/16*

U.S. Cl. 524—591 **18 Claims**

1. A process for preparing an aqueous, radiation-curable, urethane-acrylate dispersion, comprising the steps:

(i) reacting isophorone diisocyanate with a hydroxyacrylate at a temperature of 25° C. to 50° C., in a ratio of equivalents of NCO to OH of 3:1 to 5:1 to obtain an NCO-containing urethane-acrylate;

(ii) reacting said NCO-containing urethane acrylate with a

COOH-containing ester polyol, prepared from a polyol and a dicarboxylic anhydride, in the absence of a solvent at a temperature of 50° C. to 100° C., to obtain a substantially NCO-free, COOH-containing urethane-acrylate; and

(iii) emulsifying said NCO-free, COOH-containing urethane-acrylate at a temperature of 85° C. to 95° C. with an aqueous solution of a base.

5,066,714

CURABLE ORGANOPOLYSILOXANE PUTTY-LIKE COMPOSITION

Yoshio Inoue; Masachika Yoshino, both of Annaka, and Hironao Fujiki, Takasaki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Oct. 17, 1989, Ser. No. 422,206

Claims priority, application Japan, Oct. 18, 1988, 63-262120

Int. Cl.[5] C08K *5/24*

U.S. Cl. 524—731 **23 Claims**

1. A curable organopolysiloxane putty-like composition which comprises:

(1) 100 parts by weight of an organopolysiloxane having at least two alkenyl groups in one molecule;

(2) an organohydrogenpolysiloxane having at least three ≡SiH groups in one molecule wherein the hydrogen atoms are directly bonded to the respective silicon atoms and used in an amount sufficient to provide 0.5 to 5 times by mole of the ≡SiH groups relative to the alkenyl groups in the ingredient (1);

(3) a catalytic amount of platinum or a platinum compound;

(4) from 20 to 600 parts by weight of an inorganic filler; and

(5) from 5 to 60 parts by weight of an organopolysiloxane having from 5 to 50 mole % of alkyl groups having from 7 to 30 carbon atoms based on the total organic groups bonded to silicon atoms.

5,066,715

AQUEOUS SYNTHETIC RESIN DISPERSIONS

Maximilian Angel, Mutterstadt, and Andreas Einwiller, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 30, 1990, Ser. No. 502,236

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3911943

Int. Cl.[5] C08L *33/24*

U.S. Cl. 524—812 **3 Claims**

1. An aqueous synthetic resin dispersion, obtained by single-stage emulsion polymerization of a monomer mixture consisting of

(a) from 35 to 70.5% by weight of vinyl acetate, vinyl propionate or combinations thereof (monomer A),

(b) 0.5–10% by weight of acrylamidoglycolic acid, methacrylamidoglycolic acid, or combinations thereof (monomer B),

(c) 25–64.5% by weight of at least one monomer selected from the group consisting of acrylonitrile, styrene and esters of an α,β-monoethylenically unsaturated monocarboxylic acid of 2 to 5 carbon atoms and an alcohol of 1 to 4 carbon atoms (monomer C), and

(d) 0–5% by weight of at least one α,β-monoethylenically unsaturated mono- and/or dicarboxylic acid of 3 to 5 carbon atoms and/or its unsubstituted amides (monomer D), the weights of monomers A, C, and D being selected within the stated limits so that a polymer composed only of these monomers has a glass transition temperature of −50° to +60° C.

5,066,716

SYNTHESIS OF CHLOROACETYL AND BROMOACETYL MODIFIED PEPTIDES FOR THE PREPARATION OF SYNTHETIC PEPTIDE POLYMERS, CONJUGATED PEPTIDES, AND CYCLIC PEPTIDES

Frank A. Robey, Bethesda; Raymond L. Fields, Mount Airy, both of Md., and Wolfgang Lindner, Graz, Austria, assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Dec. 13, 1988, Ser. No. 283,849

Int. Cl.[5] A61K *37/02;* **C08G** *63/44, 63/91, 69/00*

U.S. Cl. 525—54.1 **22 Claims**

1. A method for the preparation of bromoacetyl or chloroacetyl derivatized peptides, which comprises the steps of:

coupling a bromoacetyl or chloroacetyl group onto a fully protected peptide to form an amide linkage between said bromoacetyl or chloroacetyl group and said fully protected peptide; and

deprotecting said fully protected peptide while still preserving the presence of said bromoacetyl or chloroacetyl group on said peptide.

5,066,717

THERMOPLASTIC MOULDING COMPOUNDS BASED ON AROMATIC POLYCARBONATES AND VINYL POLYMERS WITH IMPROVED THERMOSTABILITY

Herbert Eichenauer, Dormagen; Dieter Wittmann; Adolf Schmidt, both of Cologne, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 20, 1990, Ser. No. 511,680

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1989, 3913507

Int. Cl.[5] C08L *69/00, 51/06, 20/00;* **C08F** *2/26*

U.S. Cl. 525—67 **3 Claims**

1. Thermoplastic moulding compounds of

A) from 95–10% by weight of a thermoplastic aromatic polycarbonate or of a mixture of several aromatic polycarbonates and

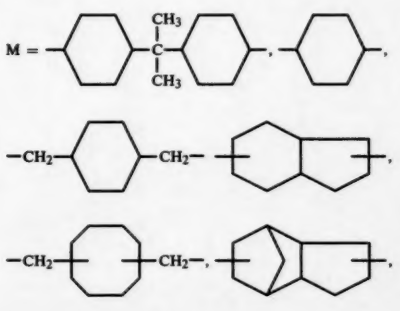
B) from 5 to 90% by weight of a mixture of

Ba) form 100 to 0 parts by weight of one or more graft polymers containing a graft base of a rubber having a Tg≦0° C. and

Bb) from 0 to 100 parts by weight of one or more thermoplastic vinyl copolymers, wherein the emulsifiers used for the preparation of polymers Ba and/or Bb by emulsion polymerisation are compounds which have been obtained by melting together 1 mol of a diol corresponding to formula I

HO—M—OH I

wherein



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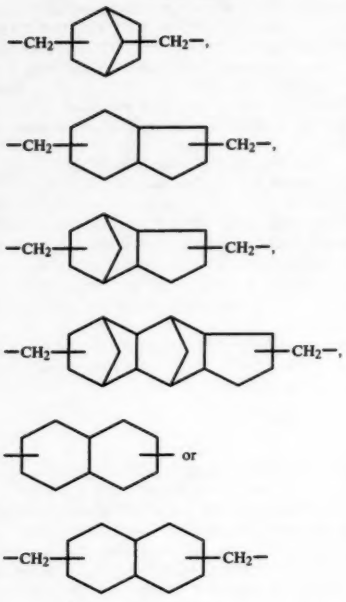
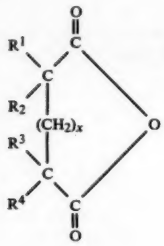
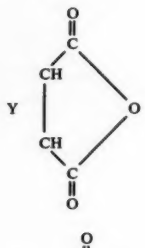


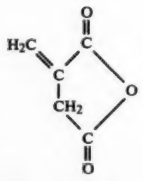
with 2 mol of a carboxylic acid anhydride corresponding to formula II and/or III and/or IV



II



III



IV

in which X=0 or 1, when

x=0,

R^1, R^2, R^3 and R^4 denote hydrogen or

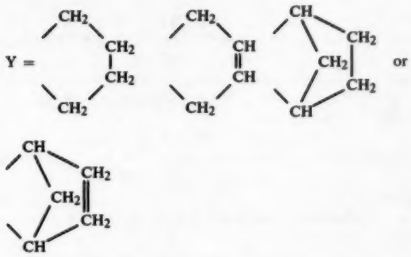
R^1 and/or R^3 denote C_1 to C_{35}-alkyl or alkenyl and

R^2 and R^4 and optionally R^1 or R^3 denote hydrogen or

R^1 and R^4 together denote a chemical bond and R^2 and R^3 denote hydrogen or

R^1 and R^4 denote a chemical bond and R^2 and R^3 together with the carbon atoms denote an o-phenylene group, and when x=1,

R^1, R^2, R^3 and R^4 denote hydrogen and



at temperatures from 100° C. to 300° C. under an inert gas followed by conversion of the reaction products into alkali metal salts or ammonium salts.

5,066,718

COMPATIBLE POLYMER MIXTURES

Werner Siol, Darmstadt-Eberstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Rohm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Sep. 18, 1989, Ser. No. 408,527

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831500

Int. Cl.[5] **C08L** *33/12, 33/08, 25/14*

U.S. Cl. 525—84 **20 Claims**

1. A compatible polymer mixture of two disparate polymers consisting essentially of:

A) 0.1–99.9 wt. % of a non-crosslinked copolymer comprised of the following monomer units

a) 90–10 wt. % methyl acrylate;

b) 10–90 wt. % styrene; and

c) 0 to <10 wt. % of one or more other monomeric vinyl compounds, other than methyl acrylate and styrene; and

B) 99.9–0.1 wt. % of a polymer comprised of the following monomer units

a) >90 to 100 wt. % methyl methacrylate; and

b) 0 to <10 wt. % of at least one monomeric vinyl compound other than methyl methacrylate.

5,066,719

POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS FROM DICARBOXYLATE-CAPPED POLYPHENYLENE ETHERS

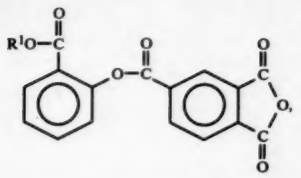
Timothy M. Sivavec, and Sharon J. McCormick, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 6, 1990, Ser. No. 475,552

Int. Cl.[5] **C08L** *51/04, 53/02, 71/12*

U.S. Cl. 525—92 **20 Claims**

1. A composition comprising at least one polyamide and a dicarboxylate-capped polyphenylene ether composition prepared by melt blending, with application of vacuum and in the absence of additional reactants, at least one polyphenylene ether with at least one trimellitic anhydride salicylate ester of the formula



(I)

wherein R^1 is C_{1-6} alkyl or a C_{6-10} aromatic hydrocarbon radical.

5,066,720

RESINOUS COMPOSITION FOR COATING USE

Hiroharu Ohsugi; Akihiro Kanakura, both of Osaka; Hirotoshi Umemoto, Kyoto; Yoshio Okamura, Gunma; Mitsuhiro Takarada, Gunma, and Kenji Yamamoto, Gunma, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka and Shinetsu Chemical Industries, Ltd., Tokyo, both of, Japan

Filed Feb. 21, 1989, Ser. No. 313,231

Claims priority, application Japan, Feb. 19, 1988, 63-38311

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 **11 Claims**

1. A resinous composition for coating use comprising

(a) 3 to 70% by weight of organopolysiloxane represented by the formula:

$$R^1{}_nR^2{}_mSiO_{(4-n-m)/2}$$

wherein R^1 represents hydrogen, allyloxy group, an alkoxy group having 1 to 20 carbon atoms, an aryl group, methyl group, or the residue, other than said allyloxy and alkoxy groups, of an organic compound having 2–100 methylene groups in its main chain which may be interrupted with ester bonding, ether bonding, urethane bonding or carbon-carbon unsaturation bonding and which may contain functional groups other than a hydroxyl group; R^2 is a hydroxyl group bearing organic group having 2 to 100 carbon atoms; m and n each represents a positive number fulfilling the requirements of $0<n<4$, $0<m<4$ and $2\leqq m+n<4$, having a number average molecular weight of 200 to 100,000 and a hydroxyl value of 20 to 400,

(b) 97 to 30% by weight of a hydroxyl group containing acrylic, alkyd, polyester, epoxy, aminoplast, acryl modified alkyd or acryl modified polyester resin having a hydroxyl value of 20 to 300, and

(c) a crosslinking agent having at least two groups which are reactive with a hydroxyl group.

5,066,721

TIRES MADE OF SILICA FILLED, SILANE MODIFIED RUBBER

Tatsuro Hamada, Higashi-murayama; Hiromi Fukuoka; Hideki Komatsu, both of Kodaira, and Tatsuo Fujimaki, Higashimurayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

PCT No. PCT/JP87/00738, 371 Date May 31, 1988, 102(e) Date May 31, 1988, PCT Pub. No. WO88/05448, PCT Pub. Date Jul. 28, 1988

PCT Filed Oct. 3, 1987, Ser. No. 202,658

Claims priority, application Japan, Jan. 14, 1987, 62-6568

Int. Cl.[5] C08L *83/08, 47/00*

U.S. Cl. 525—102 **9 Claims**

1. A tire, characterized in that a rubber composition comprising:

(A) as a rubber ingredient, not less than 10% by weight of a polymer rubber modified with a silane compound obtained by reacting an active terminal of a living polymer, which is obtained by polymerizing an unsaturated monomer in the presence of an organic alkali metal catalyst, with a silane compound represented by the following general formula:

$$X_nSi(OR)_mR'_{4-m-n}$$

wherein X is a halogen atom selected from a chlorine atom, a bromine atom and an iodine atom, OR is a non-hydrolyzable alkoxy group having a carbon number of 4~20, a non-hydrolyzable aryloxy group or a non-hydrolyzable cycloalkoxy group, R′ is an alkyl group having a carbon number of 1~20, an aryl group, a vinyl group or a halogenated alkyl group, m is an integer of 1~4, n is an integer of 0~2, and a sum of n and m is 2~4; and

(B) 5~200 parts by weight of silica based on 100 parts by weight of the rubber ingredient,

is applied to at least one portion among rubber portions of the tire.

5,066,722

HEAT-LATENT CURING CATALYST AND RESIN COMPOSITIONS CONTAINING THE SAME

Shinji Nakano, Takatsuki; Hiroharu Ohsugi, Hirakata; Satoshi Urano, Tanabecho; Masamichi Furukawa, Osakasayama; Ryozo Takagawa, Toyonaka; Yoshio Eguchi, Ikeda, and Takeshi Endo, Yokohama, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 1, 1990, Ser. No. 485,897

Claims priority, application Japan, Mar. 3, 1989, 1-52674; Mar. 3, 1989, 1-52675; Mar. 29, 1989, 1-79469; Apr. 25, 1989, 1-106737

Int. Cl.[5] C08L *61/00, 61/20, 29/02*

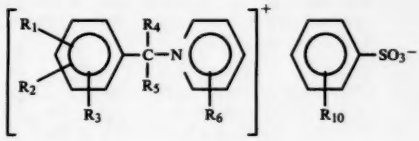
U.S. Cl. 525—162 **2 Claims**

1. A heat-curable resinous composition comprising:

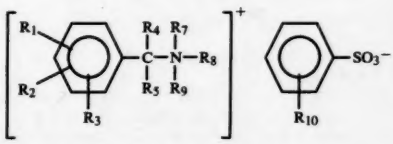
(a) a hydroxy group-containing, film-forming resin;

(b) an amount of a melamine resin at a ratio on solids basis relative to said film-forming resin of 50:50 to 5:95, and

(c) 0.01 to 10% by weight relative to the cumulative amount of said film-forming resin and said melamine resin on solids basis of a compound of the formula:



or



wherein R_1, R_2, R_3 and R_6 are each H, halogen, an alkyl, an alkoxy, nitro, amino, an alkylamino, cyano, an alkoxycarbonyl or carbamoyl; R_4 and R_5 are each H, an alkyl or halogen; R_7, R_8 and R_9 are each an alkyl, an alkenyl or phenyl which may be substituted with nitro, cyano, amino, halgen, an alkyl or a dialkylamino; and R10 is H or an alkyl.

5,066,723

IMPACT-MODIFIED POLYMERS (P-1304)

James C. Randall, Jr., Seabrook, and Terrence Huff, Baytown, both of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 219,681, Jul. 15, 1988, abandoned. This application Dec. 21, 1990, Ser. No. 632,179

Int. Cl.[5] C08L *23/26, 23/10, 23/04;* C08F *297/08*

U.S. Cl. 525—194 17 Claims

1. A process for preparing a high impact propylene polymer composition which does not contain rubber materials comprising:

a. polymerizing propylene or a mixture of propylene and one or more monomers selected from C_2 or C_4–C_{10} alpha olefins in the presence of a Ziegler catalyst, wherein a substantially isotactic propylene polymer containing at least about 90 wt.% of polymerized propylene is obtained;

b. polymerizing ethylene or a mixture of ethylene and one or more C_3 to C_{10} alpha olefin monomers in the presence of the propylene polymer composition of step (a) and optionally in the presence of additional Ziegler catalyst wherein a reactor blend comprising a continuous phase propylene polymer and a discontinuous phase thermoplastic polymer containing at least about 90 wt% of polymerized ethylene is obtained;

c. recovering the reactor blend of step (b); and

d. heating said reactor blend of step (c) in the presence of a free radical source to provide a visbroken reactor blend.

5,066,724

NOVEL FILM COMPOSITIONS

Gary J. Reich, Chippewa Falls, Wis., and Richard L. Partlow, Naperville, Ill., assignors to Rexene Products Company, Odessa, Tex.

Continuation of Ser. No. 277,821, Nov. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 112,344, Oct. 26, 1987, abandoned, which is a division of Ser. No. 855,972, Apr. 25, 1986, abandoned. This application Apr. 6, 1990, Ser. No. 506,526

Int. Cl.[5] C08L *23/20, 33/08, 23/08;* C08J *5/18*

U.S. Cl. 525—227 3 Claims

1. A resin composition suitable for processing into film consisting essentially of from about 30 to about 80 wt. % of an ethylene-methyl acrylate copolymer and from about 20 to about 70 wt. % of a very low density polyethylene having a density from about 0.902 to about 0.910 gms/cm^3, said very low density polyethylene being a non-elastomeric copolymer of ethylene and at least one comonomer selected from alpha-olefins containing from 4 to 10 carbon atoms, said film being soft, pliable, heat sealable and having a thickness from about 0.1 mils to about 10 mils.

5,066,725

POLYETHYLENE COMPOSITION, OBJECTS MADE THEREFROM AND PROCESS FOR THE MANUFACTURE OF FOAMED OBJECTS

Franciscus J. J. Haselier, Schinnen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 14, 1989, Ser. No. 337,874

Claims priority, application Netherlands, May 19, 1988, 8801297

Int. Cl.[5] C08L *23/06, 23/18, 23/26;* C08J *9/00*

U.S. Cl. 525—240 7 Claims

1. Polyethylene composition comprising 20–98 wt % branched polyethylene a) with a density of between 915 and 940 kg/m^3 and a melt flow index of between 0.05 and 40 dg/minute, prepared by a high pressure radical process, and 2–80 wt % substantially linear polyethylene b) with a density of between 850 and 915 kg/m^3, a melt flow index of between 0.05 and 25 dg/minute and a DSC crystallinity at 23° C. of at least 10%, prepared with the aid of a transition metal catalyst, the difference between the highest crystallization temperature of branched polyethylene a) and the highest DSC crystallization temperature of linear polyethylene b) being at most 10° C. and the mixture having a modulus of elasticity of at most 280 N/mm^2.

5,066,726

PROCESS FOR MELT GRAFTING EPOXY COMPOUNDS TO POLYMERS

Michael J. Modic, Richmond, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1990, Ser. No. 513,392

Int. Cl.[5] C08F *255/06, 279/02, 265/08, 287/00*

U.S. Cl. 525—263 22 Claims

1. A melt phase process to graft epoxy containing functional monomers to a base polymer, wherein the base polymer is any polymer which is graftable with alpha-beta ethylenically unsaturated monomers and is in a melt phase at a temperature of less than 240° C., to produce an epoxy functionalized polymer comprising the steps of:

a) providing a melt of the base polymer, the base polymer being essentially free of functional groups that are reactive with epoxy functionality;

b) contacting the melt of the base polymer with a functional monomer in the presence of 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane at a temperature not exceeding 240° C., the functional monomer comprising alpha-beta ethylenic unsaturation and epoxy functionality; and

c) recovering an epoxy functionalized polymer.

5,066,727

RESIN FOR TONER AND TONER CONTAINING SAME

Hironori Aizawa, Tokyo; Masaaki Shin, Fujisawa, and Atsuo Okubo, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

PCT No. PCT/JP87/00858, § 371 Date Jun. 26, 1989, § 102(e) Date Jun. 26, 1989, PCT Pub. No. WO89/04509, PCT Pub. Date May 18, 1989

PCT Filed Nov. 6, 1987, Ser. No. 381,748

Int. Cl.[5] C08F *265/10;* C08K *3/04*

U.S. Cl. 525—296 16 Claims

1. A toner resin comprising as a principal component a polymer obtained by mixing 20–80 parts by weight of a low molecular weight polymer having a number average molecular weight of 1,000–5,000 and a glass transition temperature (Tg) of 40°–75° C., wherein said low molecular weight polymer is prepared by polymerizing monomers selected from the group consisting of acrylic esters, methacrylic esters, aromatic vinyl monomers, dialkyl esters of unsaturated dibasic acids, vinyl esters, nitrogen-containing vinyl monomers, unsaturated monocarboxylic acids, unsaturated dicarboxylic acids, monoesters of unsaturated dicarboxylic acids, styrenesulfonic acid, acrylamide, methacrylamide, N-substituted acrylamides, N-substituted methacrylamides, and acrylamide propanesulfonic acid, 80–20 parts by weight of a vinyl monomer, the sum of said low molecular weight polymer and vinyl monomer being 100 parts by weight, 0.01–5 parts by weight of a polymerization initiator and 0–3 parts by weight of a crosslinking agent, dispersing the resultant mixture in water and then polymerizing the same.

5,066,728

RADIATION-REACTIVE PHENYLBUTADIENE MULTIBLOCK COPOLYMERS

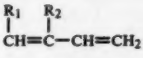
Jay D. Audett, Browndeer, Wis., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Sep. 27, 1990, Ser. No. 589,139

Int. Cl.[5] C08F *293/00;* C08J *3/28*

U.S. Cl. 525—314 11 Claims

1. A radiation-reactive multiblock copolymer, comprising: endblocks comprising polymerized monomer of the formula:



wherein at least one of R_1 and R_2 is phenyl or hydrocarbyl-substituted phenyl, and one of R_1 and R_2 can be hydrogen; and

an elastomeric midblock of a conjugated diene.

5,066,729

DIENE POLYMERS AND COPOLYMERS TERMINATED BY REACTION WITH N-ALKYL AND N-ARYL IMINES

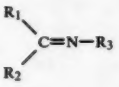
Mark L. Stayer, Jr., Suffield; Thomas A. Antkowiak, Wadsworth; David F. Lawson, Uniontown, and Russell W. Koch, Hartville, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Apr. 9, 1990, Ser. No. 506,306

Int. Cl.[5] C08F 8/32

U.S. Cl. 525—315 **28 Claims**

1. A process for preparing a terminally functionalized polymer from a living polymer suitable for use in compositions for the tread portion of tires obtained by anionic polymerization of a diene monomer or mixture of a diene monomer and a vinyl aromatic hydrocarbon monomer which comprises reacting the living polymer with a compound having the formula:



Wherein R_1 and R_2 are selected from the group consisting of H, alkyl, cycloalkyl, aryl, dialkylaminoaryl, aralkyl, and aprotic O, N and S-containing alkyl, cycloalkyl, aryl, and aralkyl groups; wherein R_3 is selected from the group consisting of alkyl, cycloalkyl, aryl, dialkylaminoaryl, aralkyl, and aprotic O, N and S- containing alkyl, cycloalkyl, aryl and aralkyl groups;

With the proviso that at least one of the R_1, R_2, and R_3 groups must be a dialkylaminoaryl group and that not all of the R_1, R_2, and R_3 groups can be aryl groups.

5,066,730

LIVING POLYMERIZATION OF OLEFINS TO END-FUNCTIONALIZED POLYMERS

Joseph P. Kennedy, and Munmaya K. Mishra, both of Akron, Ohio, assignors to The University of Akron, Akron, Ohio

Division of Ser. No. 173,049, Mar. 28, 1988, Pat. No. 4,929,683. This application Mar. 28, 1990, Ser. No. 500,771

Int. Cl.[5] C08F 255/00, 293/00, 4/06, 2/00, 10/10

U.S. Cl. 525—319 **14 Claims**

1. A method of producing a living polymer complex exhibiting supernonnucleophilic counter anions comprising the steps of:

a. reacting a Lewis acid and an organic ether at $-10°$ C. or lower to yield a carbocationic center; and

b. reacting said carbocationic center with an olefin monomer to yield said living polymer complex wherein said supernonnucleophilic counter anions do not cause deprotonation of the growing living polymer complex and chain transfer to the monomer does not occur.

5,066,731

PROCESS FOR MODIFYING ELECTROCONDUCTIVE POLYMERS USING ION EXCHANGE

Michael Feldhues, Bad Soden am Taunus; Günther Kämpf, Oestrich-Winkel, and Thomas Mecklenburg, Butzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 261,359, Oct. 24, 1988, abandoned. This application May 2, 1990, Ser. No. 517,924

Int. Cl.[5] C08G 85/00

U.S. Cl. 525—417 **5 Claims**

1. A process for the preparation of a modified intrinsically electrically conducting polymer in the oxidized (doped) form, said polymer consisting essentially of at least one polymer radical cation and the equivalent amount of at least one anion, wherein the polymer radical cation on the average comprises 20 to 100% of structural units which through linkage via the 2-position and/or 5-position are derived from at least one monomer of the formula

(I)

in which

R^1 represents a C_1-C_{12}-alkoxy group, C_2 to C_{22} alkyl group, $—CH_2O(CH_2CH_2O)_nCH_3$ or $—O(CH_2CH_2O)_nCH_3$, where n is 1 to 4 and

R^2 represents a hydrogen atom, a C_1-C_{12}-alkyl group or a C_1-C_{12} alkoxy group,

0 to 80% of structural units which are derived from at least one electron-rich heteroaromatic compound which can form electrically conducting polymers and is copolymerizable with the monomers (I),

and the anions consist essentially of:

from at least about 10% to essentially 100% by weight of at least one monomeric or polymeric organic one inorganic ion having at least one atom or at least one functional group which can carry at least one negative charge and represents the conjugate base of a Bronsted acid, and

from essentially 0% up to essentially the balance of said anions being an inorganic anion selected from the group consisting of halides, pseudohalides, halo complex anions of an element from groups 3a, 4a and 5a of the periodic table of the elements, oxo complex anions of an element from groups 3a, 4a, 5a, 6a and 7a and anionic complexes of the transition metals, or an organic ion

the degree of polymerization of the polymer radical cation ranging from three to one hundred structural units, said process comprising:

exchanging from at least 10% to essentially 100% by weight of the inorganic anion residually present because of the inorganic anion-containing electrolyte used during doping for at least one monomer or polymer organic anion in solution in the presence of a dissolved salt containing said monomer or polymer organic anion, the anion exchange taking place by establishing the solution equilibrium, taking into account the solubility products of the salts present, and

obtaining the said modified intrinsically electrically conducting polymer in the oxidized (doped form, the chemical structure and the degree of polymerization of the polymer radical cation being independent of the particular anion or anions present in the polymer structure.

5,066,732

NOVEL NON-IONIC POLYURETHANE RESINS HAVING POLYETHER BACKBONES IN WATER-DILUTABLE BASECOATS

Thomas G. Savino, Northville; Thomas C. Balch, West Bloomfield; Alan J. Steinmetz, Milford; Sergio E. Balatin, West Bloomfield, and Nicholas Caiozzo, St. Clair Shores, all of Mich., assignors to BASF Corporation, Inmont Division, Clifton, N.J.

Division of Ser. No. 288,434, Dec. 22, 1988, Pat. No. 4,946,910. This application May 2, 1990, Ser. No. 518,037

Int. Cl.[5] C08L *75/04*

U.S. Cl. 525—440 59 Claims

1. A multi-layer composition comprising:

A) a water-borne basecoat composition comprising:

i) a laterally stabilized polyurethane resin comprised of the reaction product of (a) at least one organic compound having two or more reactive hydrogen functionalities; (b) a nonionic stabilizer prepared by the reaction of: (i) a polyether having at least one active hydrogen functionality with a first polyisocyanate compound to produce a partially capped isocyanate intermediate; and (ii) a compound having at least one active amine hydrogen and at least two active hydroxyl groups: and (c) at least one second isocyanate-containing compound;

ii) a cross-linking agent;

iii) a pigment; and

B) a clear topcoat composition overcoating said basecoat composition.

5,066,733

CHIP RESISTANT COATINGS AND METHODS OF APPLICATION

Jonathan T. Martz, Glenshaw, Pa.; Thomas W. Kelly, Bloomington, Ill.; Rostyslaw Dowbenko, Monroeville, Pa.; James A. Meier, St. Saulve, France, and Anthony C. Palermo, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 333,352, Apr. 3, 1989, Pat. No. 4,971,837. This application Jul. 23, 1990, Ser. No. 556,681

Int. Cl.[5] C08L *75/06*

U.S. Cl. 525—455 9 Claims

1. A liquid coating composition, useful for making a chip resistant coating, comprising a binder of: a first and a second urethane resin each having a final free NCO content of from 0 percent to about 20 percent by weight and containing terminal, reactive ethylenically unsaturated groups, each urethane resin prepared by reacting components comprising

(A) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.5 percent to about 30 percent by weight which is the product of reacting an organic polyisocyanate with an organic polyol having an average equivalent weight of from 50 to 1000 with

(B) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates and hydroxyalkyl acrylamides

wherein the organic polyol for said first urethane resin has a hydroxyl functionality of 3 or more, the organic polyol for said second urethane resin has a hydroxyl functionality of less than three, and the average functionality of the polyols utilized for said first and second urethane resins is less than three.

5,066,734

POLYSILAZANE CERAMIC PRECURSORS AND CERAMIC SHAPED ARTICLES PRODUCED BY PYROLYSIS THEREOF

Christian Colombier, Lyons, France, assignor to Atochem, Puteaux, France

Filed Dec. 7, 1989, Ser. No. 447,528

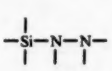
Claims priority, application France, Dec. 7, 1988, 88 16065

Int. Cl.[5] C08F *283/00*

U.S. Cl. 525—478 10 Claims

1. A ceramic precursor composition which comprises:

(i) at least one precursor polysilazane comprising a plurality of recurring structural units of the formula:



(I)

and

(ii) at least one precursor polysilazane comprising a plurality of recurring structural units of the formula:

(II)

in which formulae the available valencies of the silicon and nitrogen atoms are bonded to a saturated or unsaturated aliphatic hydrocarbon radical or to a mono- or polycyclic aryl, alkylaryl or arylalkyl radical, with the provisos that such substituents may be different or identical, at least one of the available valencies of the silicon atom or of the nitrogen atoms in formula (I) and/or the nitrogen atom in formula (II) may be satisfied by a hydrogen atom, and the silicon atom of formula (II) may be satisfied by a second hydrogen atom, in which instance the nitrogen atom in said formula (II) is substituted by a methyl radical.

5,066,735

CURABLE COMPOSITION CONTAINING A DIFUNCTIONAL EPOXY RESIN, A POLYFUNCTIONAL EPOXY RESIN, A DIFUNCTIONAL PHENOL AND A POLYFUNCTIONAL PHENOL

Louis L. Walker, Clute, and Paul A. Larson, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 372,581, Jun. 27, 1989, Pat. No. 4,959,425, which is a division of Ser. No. 121,329, Nov. 16, 1987, Pat. No. 4,868,059. This application Apr. 12, 1990, Ser. No. 509,002

Int. Cl.[5] C08G *59/00, 65/08, 65/14*

U.S. Cl. 525—482 16 Claims

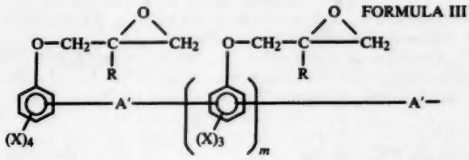
1. A composition which comprises

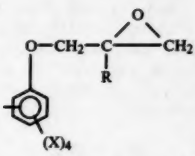
(A) an epoxy-containing component comprising a substantially unreacted mixture of

(1) from about 5 to about 95 percent by weight of at least one epoxy resin having an average of not more than 2 vicinal epoxide groups per molecule; and

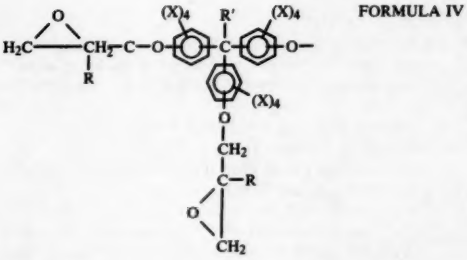
(2) from about 95 to about 5 percent by weight of at least one epoxy resin having an average of more than 2 vicinal epoxide groups per molecule represented by the following formulas III or IV or a combination of such resins

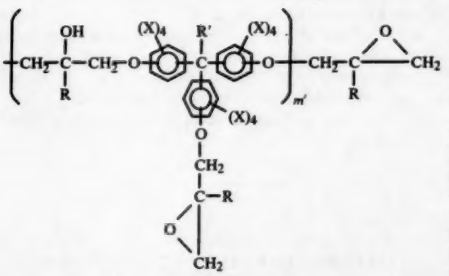
FORMULA III





FORMULA IV





wherein each A′ is independently a divalent hydrocarbyl group having from 1 to about 4 carbon atoms; each R is independently hydrogen or an alkyl group having from 1 to about 3 carbon atoms; each R′ is independently hydrogen or a hydrocarbyl group having from 1 to about 5 carbon atoms; each X is independently hydrogen, an alkyl group having from 1 to about 10 carbon atoms; m has a value from about 1 to about 4; and m′ has a value from zero to about 1; and

(B) a phenolic hydroxyl-containing component consisting essentially of

(1) from about 10 to about 70 equivalent percent of at least one phenolic hydroxyl-containing compound having an average of not more than 2 phenolic hydroxyl groups per molecule; and

(2) from about 90 to about 30 equivalent percent of at least one phenolic hydroxyl-containing compound having an average of more than 2 phenolic hydroxyl groups per molecule; and

(C) optionally, a stabilizing quantity of one or more stabilizers; and

wherein components (A) and (B) are present in quantities which provide a ratio of phenolic hydroxyl groups for each epoxy group of from about 0.75:1 to about 1.2:1.

5,066,736

GAS-PHASE ALPHA-OLEFIN POLYMERIZATION PROCESS IN THE PRESENCE OF AN ACTIVITY RETARDER

Andre Dumain; Jean Engel, and Laszlo Havas, all of Martigues, France, assignors to BP Chemicals Limited, London, England

Filed Sep. 5, 1989, Ser. No. 403,187

Claims priority, application France, Sep. 13, 1988, 88 12066; Apr. 27, 1989, 89 05846

Int. Cl.[5] C08F *2/38, 4/24*

U.S. Cl. 526—82 **14 Claims**

1. A process for the continuous gas phase polymerization of one or more alpha-olefins in a reactor having a fluidized and/or mechanically stirred bed which comprises polymerizing at least one alpha-olefin in the presence of a catalyst based on a transition metal belonging to Groups IV, V or VI of the Periodic Table of elements and continuously introducing into the reactor a very small amount of an activity retarder so that the amount of activity retarder in the gaseous mixture circulating in the reactor is less than 0.1 part per million by weight, said activity retarder being introduced at a flow rate which is varied in time in response to the polymerization rate or in response to the content of the transition metal in the polymer product so as to keep substantially constant either the polymerization rate or the content of transition metal in the polymer product.

5,066,737

OLEFIN POLYMERIZATION CATALYST

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 22, 1990, Ser. No. 600,781

Int. Cl.[5] C08F *4/654*

U.S. Cl. 526—119 **11 Claims**

1. In the process of polymerizing lower α-olefins under polymerization conditions in the presence of a catalyst formed from a titanium-based procatalyst, an organoaluminum cocatalyst and a selectivity control agent, the improvement of using as the procatalyst the olefin polymerization procatalyst produced by contacting (A) the procatalyst precursor obtained by (1) reacting magnesium alkoxide wherein each alkoxide independently has up to 4 carbon atoms inclusive, titanium tetraalkoxide wherein each alkoxide independently has up to 4 carbon atoms inclusive, and a phenolic compound selected from phenol and phenol substituted with ring carbon atom substituent free from active hydrogen atoms and which is ortho-para directing relative to aromatic ring substitution, (2) reacting the resulting product with a magnesium halide alcoholate wherein the alcohol moieties are alkanol moieties having up to 4 carbon atoms inclusive, and (3) removing alkanol from the resulting product mixture, with (B) a tetravalent titanium halide, (C) a halohydrocarbon and (D) an electron donor.

5,066,738

POLYMERIZATION OF OLEFINS WITH AN IMPROVED CATALYST SYSTEM USING A NEW ELECTRON DONOR

John A. Ewen, Houston, Tex., assignor to Fina Technology, Inc., Dallas, Tex.

Division of Ser. No. 282,985, Dec. 2, 1988, Pat. No. 4,927,797, which is a continuation-in-part of Ser. No. 36,080, Apr. 9, 1987, abandoned. This application Apr. 20, 1990, Ser. No. 512,283

Int. Cl.[5] C08F *4/649*

U.S. Cl. 526—124 **10 Claims**

1. A process for the polymerization of olefins, comprising:

(a) preparing a solid catalyst component by: (i) suspending a dialkoxy magnesium in an aromatic hydrocarbon that is liquid at normal temperatures, (ii) contacting the dialkoxy magnesium with a titanium halide and further contacting the resulting composition a second time with the titanium halide, and (iii) contacting the dialkoxy magnesium with a diester of an aromatic dicarboxylic acid at some point during the treatment with the titanium halide in (ii);

(b) contacting the catalyst component with an organoaluminum compound;

(c) contacting said catalyst component with an electron donor either simultaneously with or after step (b) to form a catalyst system, said electron donor being described by the formula:

wherein R_1 is a bulky, alkyl or cycloalkyl group containing at least one secondary or tertiary carbon atom; R_2 and R_3 are each independently an alkyl or aryl group; and R_4 is an alkyl group with a primary carbon atom attached to the silicon atom;

(d) introducing said catalyst system into a polymerization reaction zone containing an olefin monomer; and

(e) polymerizing said monomer.

5,066,739

OLEFIN POLYMERIZATION WITH CYCLOPENTADIENYL LANTHANIDEALKYL OF HYDRIDE IN PRESENCE OF HYDROGEN

Ted M. Pettijohn, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 30, 1990, Ser. No. 560,652
Int. Cl.[5] C08F *4/52, 10/02*
U.S. Cl. 526—127 **13 Claims**

1. A process for polymerizing ethylene comprising contacting ethylene under suitable reaction conditions with a catalyst comprising a catalytic amount of at least one compound of the formula Cp_2MR wherein Cp is cyclopentadienyl or cyclopentadienyl substituted with an alkyl or an alkyl silyl radical, M is a metal selected from scandium, yttrium, and metals having atomic numbers in the range of 57 to 71, and R is selected from hydrogen, alkyl radicals having 1 to 12 carbon atoms, aralkyl radicals having 7 to 12 carbon atoms, aryl radicals containing 6 to 12 carbon atoms, and alkaryl radicals containing 7 to 12 carbon atoms, said polymerization being carried out in the presence of hydrogen in an amount sufficient to increase the active lifetime of the catalyst.

5,066,740

PYRIDINIUM METATHESIS CATALYSTS FOR CYCLOOLEFIN POLYMERIZATION

Larry F. Rhodes, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 26, 1989, Ser. No. 457,042
Int. Cl.[5] C08F *4/78*
U.S. Cl. 526—160 **20 Claims**

1. A process for preparing a polymer by ring opening polymerization in the presence of a metathesis catalyst system, said process comprising the steps of polymerizing a monomer charge comprising a norbornene-type monomer, or a mixture thereof, in the presence of an effective amount of a metathesis catalyst component selected from the group consisting of substituted pyridinium heteropolymolybdates, substituted pyridinium isopolymolybdates, substituted pyridinium heteropolytungstates, substituted pyridinium isopolytungstate, and mixtures thereof, and an effective amount of a metathesis cocatalyst component, and said norbornene-type monomer is selected from polycycloolefins which contain at least one norbornene group.

5,066,741

PROCESS FOR PREPARATION OF SYNDIOTACTIC VINYL AROMATIC POLYMERS

Richard E. Campbell, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 498,162, Mar. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 414,846, Sep. 29, 1989, abandoned. This application Jul. 30, 1990, Ser. No. 559,475
Int. Cl.[5] C08F *4/76, 12/08*
U.S. Cl. 526—171 **15 Claims**

1. A process for preparing polymers of vinyl aromatic monomers having a high degree of syndiotacticity comprising contacting one or more vinyl aromatic monomers under polymerization conditions with a catalytically effective amount of a catalyst comprising a metal complex containing compound the formula:

$$[Cp_mMX_nX'_p]^+A^-$$

wherein:

Cp is a single η^5-cyclopentadienyl or η^5-substituted cyclopentadienyl group, the substituted cyclopentadienyl group being optionally also bonded to M through a substituent:

M is a metal of Group 3, 4, 5, 6, 8, 9, 10 or the Lanthanide Series of the Periodic Table;

X each occurrence is an inert anionic ligand, with the proviso that at least one X is R:

X' is an inert, neutral, donor ligand:

R is hydride, hydrocarbyl, silyl, a combination thereof or a halo or alkoxy substituted derivative thereof having up to 20 carbon, silicon or carbon and silicon atoms:

m and p are independently 0 or 1;

n is an integer greater than or equal to 1, the sum of m and n is one less than the valence of M, or when Cp is optionally bonded to M through the substituent, the sum of m and n is two less than the valence of M; and

A^- is a noncoordinating, compatible anion of a Bronsted acid salt.

5,066,742

MANUFACTURE OF C2-C8 OLEFIN/MALEIC ANHYDRIDE COPOLYMERS

Vijai P. Gupta, Berwyn, Pa., assignor to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Aug. 6, 1990, Ser. No. 562,765
Int. Cl.[5] C08F *2/00*
U.S. Cl. 526—216 **15 Claims**

1. A method for producing a C_2–C_8 olefin/maleic anhydride copolymer comprising:

(a) polymerizing maleic anhydride and a C_2–C_8 olefin in the presence of a free radical polymerization catalyst in a blend of a reaction solvent selected from the group consisting of esters of acetic acid, formic acid, and propionic acid and a C_6 to C_{12} hydrocarbon diluent to form a polymerized mixture;

(b) distilling the polymerized mixture to remove substantially all of the reaction solvent and any unreacted maleic anhydride;

(c) adding a sufficient amount of water to the polymerized mixture containing the C_2–C_8 olefin/maleic anhydride copolymer, hydrocarbon diluent, and catalyst residue to facilitate the removal of the hydrocarbon diluent and volatile catalyst residue; and

(d) distilling to remove substantially all of the hydrocarbon diluent and volatile catalyst residue and to provide an aqueous C_2–C_8 olefin/maleic anhydride copolymer suspension.

5,066,743

TWO-PART COMPOSITION COMPRISING A CYANOACRYLATE ADHESIVE AND A PRIMER COMPRISING A TERTIARY AMMONIUM CARBOXYLATE COMPOUND

Yoshihisa Okamoto, Avon, and Philip T. Klemarczyk, Collinsville, both of Conn., assignors to Loctite Corporation, Hartford, Conn.

Division of Ser. No. 329,221, Mar. 27, 1989, Pat. No. 4,979,993. This application Aug. 16, 1990, Ser. No. 568,386

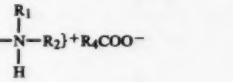
Int. Cl.[5] C08F *2/00, 20/34*

U.S. Cl. 526—215 **25 Claims**

1. A two-part composition for adhesively bonding surfaces, comprising:

(a) a cyanoacrylate adhesive composition; and

(b) a primer comprising at least one tertiary ammonium carboxylate compound of the formula:



wherein:

R_1, R_2, R_3, and R_4 may each vary independently of the others and are each selected from the group consisting of alkyl, alkenyl, alkynyl, alkylaryl, and aralkyl.

5,066,744

METHOD OF POLYMERIZING VINYL CHLORIDE

Shuji Suyama, and Tomoyuki Nakamura, both of Aichi, Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Dec. 11, 1989, Ser. No. 448,637

Claims priority, application Japan, Dec. 22, 1988, 63-322154

Int. Cl.[5] C08F *4/38*

U.S. Cl. 526—228 **1 Claim**

1. In a method of polymerizing vinyl chloride monomer alone or together with a vinyl monomer copolymerizable therewith, an improvement comprising using a combination system polymerization initiator consisting of

(A) α,α'-bis(neodecanoylperoxy)-diisopropylbenzene, and

(B) at least one of peroxy ester, diacyl peroxide and peroxy dicarbonate, each of which has a 10-hour half-life period temperature within the range of 40°-60° C. in its 0.1 concentration solution in benzene,

wherein the polymerization temperature is within the range of more than 30° C. but less than 60° C., component (A) is present in an amount of 0.001–1 part by weight based on 100 parts by weight of the vinyl chloride monomer alone or together with the vinyl monomer copolymerizable therewith, and component (B) is present in an amount ¼-4 times that of component (A).

5,066,745

ALKENYLPHOSPHONIC AND —PHOSPHINIC ACID ESTERS, PROCESS FOR THEIR PREPARATION, HYDROGELS PRODUCED USING THEM, AND THEIR USE

Friedrich Engelhardt; Ulrich Riegel, both of Frankfurt; Joachim Gersdorf, Wiesbaden, and Hans-Jerg Kleiner, Kronberg, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

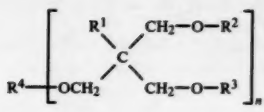
Division of Ser. No. 348,395, May 8, 1989, Pat. No. 4,959,441. This application May 29, 1990, Ser. No. 529,653

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817425

Int. Cl.[5] C08F *30/02, 30/04*

U.S. Cl. 526—240 **3 Claims**

1. Water-swellable hydrogels prepared by copolymerization of ethylenically unsaturated hydrophilic monomers and a crosslinking amount of compounds of the formula

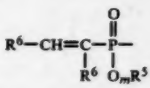


(I)

in which

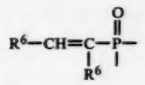
n denotes 1 or 2

R^1 denotes alkyl having 1 to 4 carbon atoms, CH_2OH or CH_2OR^7 in which R^7 denotes the formula (III)



(III)

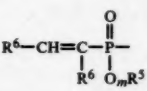
in which m denotes 0 or 1 and R^5 denotes alkyl having 1 to 4 carbon atoms, where, if a compound of the formula I contains more than one of formula III, each R^5 is independent of one another and R^6, independently of one another, denote hydrogen or alkyl having 1 to 4 carbon atoms or, when n is 1, R^7 is together with R^4, a moiety of the formula (II)



(II)

where R^6 is as defined above,

R^2 denotes the formula (III)

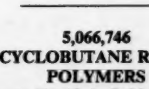


(III)

where m, R^5, and R^6 are as defined above,

R^3 denotes hydrogen or a moiety of formula (III), or R^2 and R^3 together form a moiety of formula (II),

where n is 1, R^4 denotes hydrogen, a moiety of formula (III) or, when R^1 represents alkyl having 1 to 4 carbon atoms and R^2 and R^3 together are a moiety of the formula (II), R^4 denotes a moiety of the general formula (IV)



(IV)

and, when n is 2, R^4 denotes a moiety of the formula (II).

5,066,746

PERFLUOROCYCLOBUTANE RING-CONTAINING POLYMERS

Katherine S. Clement; David A. Babb, both of Lake Jackson, Tex., and Bobby R. Ezzell, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 364,667, Jun. 9, 1989. This application Jun. 7, 1990, Ser. No. 534,819

Int. Cl.[5] C08F *14/18*

U.S. Cl. 526—242 **18 Claims**

1. A process for preparing a polymer having perfluorocyclobutane rings comprising the steps of:

(a) contacting monomers having at least two dimerizable perfluorovinyl groups; and

(b) exposing the monomers to sufficient heat and for a sufficient time that a polymer containing perfluorocyclobutane rings is formed

wherein at least about 0.05 mole percent of the monomers have at least three dimerizable perfluorovinyl groups.

5,066,747

VINYL ETHERS AND FLUORINE-CONTAINING COPOLYMERS PREPARED THEREFROM

Tatsushiro Yoshimura; Nobuyuki Tomihashi; Tsutomu Terada, all of Takatsuki; Masayuki Yamana, Osaka; Kazuhiro Nakai, and Takayuki Araki, both of Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Division of Ser. No. 168,073, Mar. 9, 1988, Pat. No. 4,970,331. This application Sep. 27, 1990, Ser. No. 588,872

Claims priority, application Japan, Mar. 10, 1987, 62-54690; Jul. 29, 1987, 62-189590; Jul. 29, 1987, 62-189591

The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.

Int. Cl.[5] C08F *12/20*

U.S. Cl. 526—249 **4 Claims**

1. Fluorine-containing copolymers prepared by copolymerizing fluoroolefins with vinyl ethers of the formula (I):

$$CH_2{=}CHOR^1OC(=O)R^2C(=O)O(H)_nM \quad (I)$$

wherein R^1 is a divalent aliphatic residue of 2 to 10 carbon atoms, R^2 is a divalent organic residue, and M is an alkali metal, or a mono-functional basic compound which contains nitorgen atom or phosphorus atom and has a pKa of 6 to 12, and n is O when M is the alkali metal, and is l when M is other, or monomer compositions of the vinyl ethers (I) and vinyl ethers of the formula (II):

$$CH_2{=}CHOR^1OC(=O)R^2C(=O)OH \quad (II)$$

wherein R^1 and R^2 are as defined above, and said monomer compositions containing the vinyl ethers (I) in an amount of not less than 1% by mole of the vinyl ethers (II).

5,066,748

SILICON CONTAINING ELECTROCONDUCTIVE POLYMERS AND STRUCTURES MADE THEREFROM

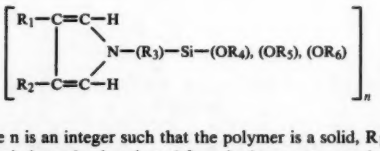
Ganesan Nagasubramanian, La Crescenta; Salvador DiStefano, Alhambra, and Ranty H. Liang, Arcadia, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 7, 1990, Ser. No. 479,485

Int. Cl.[5] H01B *1/00*

U.S. Cl. 526—258 **11 Claims**

1. A solid polymer of the formula:



where n is an integer such that the polymer is a solid, R_1 and R_2 are independently selected from hydrogen or organic substituents, containing up to 14 carbon atoms which are free of olefinic or alkynyl unsaturation, R_3 is a divalent organic radical selected from the group consisting having from 4 to about 7 atoms and phenyl groups, and R_4, R_5 and R_6 are independently selected from the group consisting of unsubstituted phenyl groups, unsubstituted cycloalkyl containing 1 to 7 carbon atoms and straight or branched alkyl group having from 1 to about 7 carbon atoms.

5,066,749

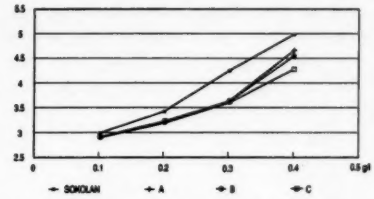
HYDROPHOBICALLY-MODIFIED POLYCARBOXYLATES AND PROCESS FOR THEIR PREPARATION

John C. Leighton, Flanders; Carmine P. Iovine, Bridgewater, both of N.J.; Michael P. Aronson, West Nyack, N.Y., and David L. Elliott, Hawthorne, N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

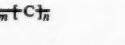
Filed Sep. 11, 1990, Ser. No. 580,695

Int. Cl.[5] C08F *34/02, 122/04, 222/04, 8/14*

U.S. Cl. 526—271 **12 Claims**



1. An interpolymer comprising repeating units of the structure:



wherein m is a mole fraction from 0.70 to 0.95; n is a mole fraction from 0.05 to 0.30; A and B are a polymerized residue of ethenically unsaturated carboxylic acid monomer(s), selected from monocarboxylic acids, dicarboxylic acids and their anhydrides and esters, and B is not A; and C is:

a polymerized residue of at least one monomer, selected from the group consisting of C_8–C_{18} linear or branched alkyl ester(s) of ethylenically unsaturated carboxylic acid(s); C_8–C_{18} alpha-olefin(s); and vinyl esters of C_8–C_{18} carboxylic acid(s); the interpolymer being prepared by polymerizing the monomers in a solvent system in which the monomers and interpolymer are soluble, whereby the monomer of which C is the polymerized residue is instantaneously and homogeneously copolymerized with the carboxylic acid monomers.

5,066,750

VINYL ESTER RESINS CONTAINING MESOGENIC/RIGID RODLIKE MOIETIES

Robert E. Hefner, Jr.; Paul M. Puckett, and Jimmy D. Earls, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 298,460, Jan. 17, 1989. This application Jun. 4, 1990, Ser. No. 532,544

Int. Cl.[5] C08F *24/00, 124/00, 224/00, 8/00*

U.S. Cl. 526—273 **8 Claims**

1. A thermosettable mixture comprising

(A) a thermosettable vinyl ester prepared by reacting

(1) one or more polyepoxide compounds; with

(2) one or more polymerizable monounsaturated monocarboxylic acids; and blending said reaction product with

(B) one or more polymerizable ethylenically unsaturated monomers, at least one of which contains a mesogenic or rigid rodlike moiety.

5,066,751

RESIST MATERIAL FOR ENERGY BEAM LITHOGRAPHY AND METHOD OF USING THE SAME

Akiko Kotachi, Yokohama; Satoshi Takechi, Machida, and Yuko Nakamura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 22, 1990, Ser. No. 468,083
Claims priority, application Japan, Jan. 20, 1989, 1-012447
Int. Cl.[5] C08F *30/08*
U.S. Cl. 526—279 10 Claims

1. A resist material comprising a copolymer of silicon containing methacrylic ester the and acrylic ester, alpha-position of the acrylic ester being substituted by an electron attracting group.

5,066,752

FLAME RETARDANT BROMINATED STYRENE-BASED POLYMERS

Nicolai A. Favstritsky, and Jin-Liang Nang, both of Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

Filed Jun. 20, 1990, Ser. No. 541,057
Int. Cl.[5] C08F *12/16*
U.S. Cl. 526—293 33 Claims

1. A thermally and hydrolytically stable flame retardant copolymer comprising:

about 95 to about 5 weight percent of units from ring brominated, ethylenically unsaturated aromatic monomer, said monomer including greater than about 1 and up to about 4 bromines per unit; and

about 5 to about 95 weight percent of units from aliphatic conjugated diene monomer having from 4 to 10 carbon atoms,

said copolymer having a molecular weight of at least about 25,000.

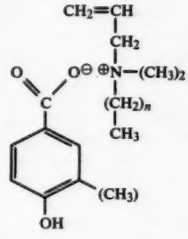
5,066,753

POLYMERIZABLE CATIONIC VISCOELASTIC MONOMER FLUIDS

Dennis G. Peiffer, East Brunswick, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 21, 1987, Ser. No. 135,596
Int. Cl.[5] C08F *265/04*
U.S. Cl. 526—310 4 Claims

1. A water soluble polymerizable monomer characterized by the formula:



wherein n is 6 to 22.

5,066,754

NARROW MOLECULAR WEIGHT DISTRIBUTION HYDROCARBON SOLUBLE HOMOPOLYMER OF 1,4-PENTADIENE

Yoshiharu Doi, Kanagawa; Satoshi Ueki, and Hiroyuki Furuhashi, both of Saitama, all of Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Mar. 14, 1990, Ser. No. 493,254
Claims priority, application Japan, Mar. 28, 1989, 1-73986
Int. Cl.[5] C08F *136/20*
U.S. Cl. 526—336 1 Claim

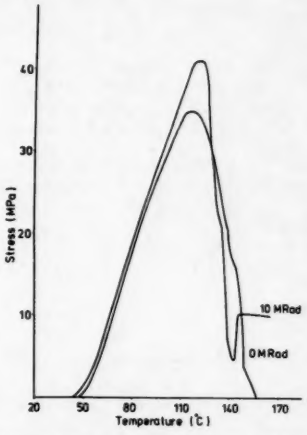
1. Hydrocarbon soluble homopolymer of 1,4-pentadiene having a Mn in range of about 2,000 to 500,000 and a Mw/Mn of 1.05 to 1.4, having side chain unsaturation.

5,066,755

NOVEL IRRADIATED POLYETHYLENE FILAMENTS TAPES AND FILMS AND PROCESS THEREFOR

Pieter J. Lemstra, Brunssum, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 61,672, Jun. 15, 1987, abandoned, which is a continuation of Ser. No. 705,284, Feb. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 621,767, Jun. 18, 1984, abandoned, and a continuation-in-part of Ser. No. 161,424, Feb. 24, 1988, abandoned, which is a continuation of Ser. No. 20,702, Mar. 2, 1987, abandoned, which is a continuation of Ser. No. 822,409, Jan. 3, 1986, abandoned.
This application Mar. 2, 1989, Ser. No. 302,352
Claims priority, application Netherlands, May 11, 1984, 8401518; Aug. 25, 1984, 8402600; Sep. 28, 1984, 8402965; Oct. 5, 1985, PCT/EP85/00223
Int. Cl.[5] D01F *6/04;* D01D *5/12*
U.S. Cl. 526—348.1 25 Claims



1. A gel-spun, irradiated and drawn, and at least partially cross-linked branched ultra high strength polyethylene article in the form of a film, tape or fiber possessing high shrink properties and exhibiting the following characteristics in combination

(1) a tensile strength of at least (2.3-1.3×10 $^{-2}$D) GPa where D is the thickness or diameter of uniaxially oriented tapes and filaments, in μm, or a tensile strength of at least 0.5 GPa in case of biaxially drawn films;

(2) a modulus of at least 30 GPa;

(3) a xylene insoluble content of at least 25%;

(4) an at least 20% retained peak area under the DSC main melting point curve, upon second heating after an initial heating about 170° C.;

(5) a retention of a retractive force plateau after reaching thermal equilibrium upon heating the fiber to a temperature above about 170° C.; and

(6) retention, after heating and reaching thermal equilibrium above 170 ° C. under restraint, of an X-ray diffraction pattern substantially corresponding to the oriented, crystallized polyethylene.

12. A process for the production of novel irradiated ultra high strength polyethylene filaments, tapes and films which essentially consists in

(a) forming a solution of a high molecular weight polyethylene

(b) spinning or extruding said solution through an orifice

(c) quenching the extrudate from step (b) to a temperature below the gel point of said solution to form a gel-state article in the form of filament, tape or film

(d) irradiating said gel-state article while in the gel-state

(e) and drawing or stretching said gel-state article either during or after said irradiation to form a drawn or stretched article composed of at least partially cross-linked or long-chain branched polyethylene molecules having the combination of properties

(1) a tensile strength of at least $(2.3\text{-}1.3\times10^{-2}D)$ GPa where D is the thickness or diameter of uniaxially oriented tapes and filaments, in μm, or a tensile strength of at least 0.5 GPa in case of biaxially drawn films;

(2) a modulus of at least 30 GPa;

(3) a xylene insoluble content of at least 25%;

(4) an at least 20% retained peak area under the DSC main melting point curve, upon second heating after an initial heating about 170° C.;

(5) a retention of a retractive force plateau after reaching thermal equilibrium upon heating the fiber to a temperature above about 170° C.; and

(6) retention, after heating and reaching thermal equilibrium above 170° C. under restraint, of an X-ray diffraction pattern substantially corresponding to the oriented, crystallized polyethylene.

5,066,756

SILICONE SURFACTANTS

William J. Raleigh, Rensselaer; Raymond J. Thimineur, Scotia, and Anthony A. Zotto, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

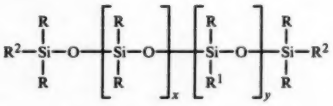
Division of Ser. No. 291,909, Dec. 29, 1988, Pat. No. 5,008,103. This application Oct. 25, 1990, Ser. No. 603,081

Int. Cl.[5] C08G *77/20*

U.S. Cl. 528—32 **11 Claims**

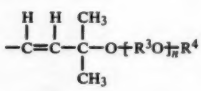
1. A polysiloxane surface active agent comprising polymers of the general formula (I):

(I)



wherein each R individually is chosen from the group consisting of alkyl radicals having from 1 to 4 carbon atoms; R^1 is a polyoxyalkylene radical of the formula

(II)



wherein each R^3 individually is an alkylene radical having from 2 to 6 carbon atoms, R^4 is chosen from the group consisting of R, acyl groups having at least 2 carbon atoms, and hydrogen, and n has a value from at least 1 to about 200; each R^2 individually is chosen from the group consisting of R and R^1; x has a value from about 5 to about 400; and y has a value of at least 1 except that when R^2 is R^1, y may be zero.

5,066,757

ONE-CAN HEAT-CURABLE RESIN COMPOSITIONS AND PRECOATED METAL

Shigeaki Miyabayashi, Kobe; Takuro Sakamoto, Kawanishi; Hiroshi Kanai, Kimitsu, and Joji Oka, Tokyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 3, 1990, Ser. No. 460,552

Claims priority, application Japan, Jan. 6, 1989, 1-001476

Int. Cl.[5] C08G *18/80*

U.S. Cl. 528—45 **6 Claims**

1. A one-can heat-curable resin composition which comprises: (1) a polyester polyol having at least three functional groups; (2) an adduct of an epoxy resin with at least one member selected from the group consisting of an alkanol amine and a monovalent phenol; and (3) a blocked organic polyisocyanate or a product of blocking of a prepolymer having terminal NCO groups obtained by reaction of an organic polyisocyanate with an active hydrogen-containing compound.

5,066,758

CARRIER RESIN FOR PIGMENT PASTES, AND ITS PREPARATION AND USE

Michael Hönel; Peter Ziegler, both of Mainz; Walter Sprenger, Dieburg, and Wolfgang Wendt, Wuppertal, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Jul. 26, 1989, Ser. No. 385,908

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825584

Int. Cl.[5] C09D *17/00*

U.S. Cl. 528—45 **25 Claims**

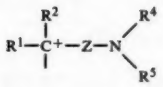
1. A paste resin based on an epoxy compound, this paste resin containing

(a) quaternary ammonium groups of the formula (Ia)

Ia

in which the radicals R^1 to R^3 independently of one another represent a hydrocarbon radical having 1 to 7 carbon atoms, or two of these radicals form a cyclo-aliphatic ring, or quaternary ammonium groups of the formula (Ib)

Ib



in which the radicals R^1 and R^2 have the meaning above,

Z represents a linear, branched or cyclic alkylene radical having 2 to 18 carbon atoms, which may optionally carry OH groups and/or contain oxygen atoms, and

R^4 and R^5 independently of one another denote a hydrocarbon radical having 2 to 50 carbon atoms, which may optionally carry OH and/or silane groups and/or contain oxygen atoms, or one of the two radicals R^4/R^5 may form a ring, or mixtures of the groups (Ia) and (Ib),

(b) OH groups and

(c) urethane groups and of which at least 10 mol% are derived from a long-chain, monofunctional isocyanate having at least 8 carbon atoms,

the mean molecular weight (M_n) of these paste resins being 500 to 10,000.

5,066,759

PROCESS FOR THE PREPARATION OF MACROMONOMERS AND MACROMONOMERS PREPARED BY THIS PROCESS

Hans-Dieter Hille, Bergisch Gladbach, and Arnold Dobbelstein, Munster, both of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Munster-Hiltrup, Fed. Rep. of Germany

PCT No. PCT/EP88/00969, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO89/04333, PCT Pub. Date May 18, 1989

PCT Filed Oct. 27, 1988, Ser. No. 466,438

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738079

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—60 15 Claims

1. A process for the preparation of macromonomers which carry at least two hydroxyl groups at one end, which comprises

(1) reacting a polyester, polyether, polyurethane, polyurea or polyamide prepolymer which has a number average molecular weight of 300 to 3000, and contains an average of one terminal hydroxyl or amino group and at least one carboxyl group per molecule, with a diisocyanate to form an intermediate which contains an average of one terminal isocyanate group and at least one carboxyl group per molecule, and; subsequently reacting this intermediate with a compound which has a molecular weight of 90 to 800, and contains at least two hydroxyl groups in addition to the group which is reactive to isocyanate groups, to form a macromonomer which carries an average of at least one carboxyl group and, at one end, at least two hydroxyl groups per molecule.

5,066,760

MIXED POLYIMIDES AND PROCESS FOR PREPARING THEM

Sigrid Seidl, Seewalchen; Klaus Weinrotter, Vöcklabruck, and Reinhold Simharl, Lenzing, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

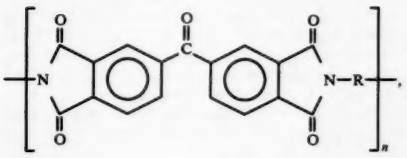
Filed Jun. 29, 1990, Ser. No. 546,517

Claims priority, application Austria, Jul. 13, 1989, 1700/89

Int. Cl.[5] C08G *18/00*

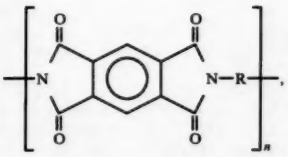
U.S. Cl. 528—51 9 Claims

1. In mixed polyimides having structural units of the general formulae



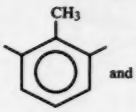
(I)

and



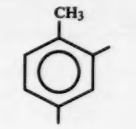
(II)

wherein n is an integer larger than 1 and R represents a divalent aromatic residue, the improvement wherein R represents at least one of the groups selected from



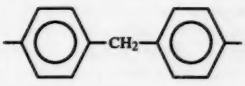
(IIIa)

and



(IIIb)

and



(IV)

and wherein the glass transition temperature lies above 325° C., with the proviso that R represents at least one of the groups (IIIa) and (IV) if it also stands for the group (IIIb).

5,066,761

CURABLE POLYURETHANE CASTING SYSTEMS AND AMINE HARDENERS THEREFOR

Teruko Miyazaki, Okemos, Mich., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 274,081, Nov. 21, 1988, Pat. No. 4,927,901. This application Feb. 5, 1990, Ser. No. 475,050

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—64 6 Claims

1. An amine hardener comprising

(a) diethyltoluenediamine or t-butyl-meta-toluenediamine and

((b) 4,4'-dimethylene-bis-ortho-ethylaniline in a molar ratio of from about 99:1 to about 1:99.

5,066,762

THERMOPLASTIC POLYURETHANE RESIN FROM P-PHENYLENE DIISOCYANATE, A POLY(HEXAMETHYLENE CARBONATE) POLYOL, AND A SHORT CHAIN POLYOL

Yukio Ohbuchi; Yoshiaki Maeda; Masahiro Kawasaki; Susumu Sato, and Mamoru Akimoto, all of Yokohama, Japan, assignors to Nippon Polyurethane Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 247,107, Sep. 20, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 488,397

Claims priority, application Japan, Oct. 6, 1987, 62-250652

Int. Cl.[5] C08G *18/10, 18/20, 18/24, 18/44*

U.S. Cl. 528—85 20 Claims

1. A thermoplastic polyurethane resin which is the product of reacting:

(A) p-phenylene diisocyanate,

(B) a hydroxyl terminated poly(hexamethylene carbonate) polyol having a molecular weight of from 850 to 5000 which is obtained by the reaction of 1,6-hexane diol and carbonic acid esters, and

(C) a short chain polyol having from 2 to 10 carbon atoms as a chain extending agent,

wherein the molar ratio of (B) to (C) is from 1:2 to 1:0.05, and the molar ratio of isocyanate groups to total active hydrogen groups is from 0.93:1 to 1.20:1.

5,066,763

MONOEPOXIDE-POLYOL ADDUCTS AND PROCESS FOR PREPARING THE SAME

Olivier L. P. Andre, and Henricus P. H. Scholten, both of Louvain-la-Neuve, Belgium, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1990, Ser. No. 539,415

Claims priority, application United Kingdom, Jun. 20, 1989, 8914161

Int. Cl.[5] C08G 59/68, 65/10

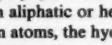
U.S. Cl. 528—92 26 Claims

1. A curable coating composition comprising:

(1) an adduct prepared by reacting, in the presence of an etherification catalyst selected from tin, zinc, and iron compounds:

a) at least one polyhydric alcohol of formula $R(OH)_n$ in which R is an aliphatic or heterocyclic moiety of from 2 to 18 carbon atoms, the hydroxyl groups are attached to a primary carbon atom or a secondary carbon atom in which the second hydroxyl group is attached to a carbon atom no more than 4 carbon atoms away from said secondary carbon atom, and n is an integer of from 2 to 6, and

b) at least an equimolar amount of at least one monoepoxide of formula



in which R' is an unsubstituted or substituted aromatic moiety of up to 14 carbon atoms,

said adduct having a molecular weight distribution Mz/Mw within the range of 1 to 1.1; and

(2) an effective amount of a crosslinking resin to cure the adduct.

5,066,764

STERICALLY HINDERED DITERTIARY BUTYL BRIDGED DI(CYCLOHEXYLAMINES)

Jeremiah P. Casey, Emmaus; Peter A. Lucas, Allentown, and Menas S. Vratsanos, Breinigsville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

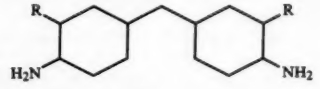
Filed Jun. 26, 1990, Ser. No. 543,899

Int. Cl.[5] C08G 59/50

U.S. Cl. 528—122 6 Claims

1. In a polyepoxide resin composition comprising a glycidyl ether of a polyhydric phenol, glycidyl polyester or glycidyl amine cured with an amine curing agent, the improvement which comprises utilizing as said curing agent, or component thereof, 3,3'ditertiarybutylmethylenedi(cyclohexylamine).

6. A bridged di(cyclohexylamine) of the structure



wherein R is tert-butyl.

5,066,765

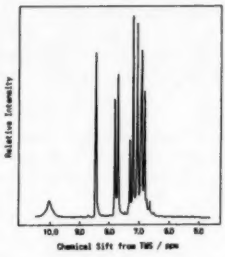
POLY(AZOMETHINE-ESTER) HAVING FILM-FORMING ABILITY, AND HEAT RESISTANCE PRE AND REGULATED MONOMER SEQUENCES IN THE POLYMER BACKBONE

Keiichiro Wada, San Marcos; Patrick E. Cassidy, and William S. Hager, both of Austin, all of Tex., assignors to Nippon Steel Chemical Co., Ltd., Tokyo, Japan

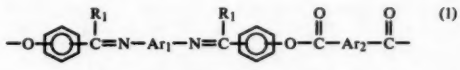
Filed Apr. 11, 1990, Ser. No. 507,536

Int. Cl.[5] C08G 63/00

U.S. Cl. 528—185 5 Claims



1. A poly(azomethine-ester) having a repeating structural unit of the following formula (1)



(1)

wherein Ar_1, and Ar_2 are the same or different and are at least one member selected from the group consisting of phenylene and divalent organic radicals terminated with an aromatic ring on the both ends of the each radical, respectively, and R_1 is at least one member selected from the group consisting of hydrogen, alkyl, alkoxy and aryl radical.

5,066,766

PROCESS FOR THE PREPARATION OF POLY(ESTER-CARBONATES)

Winston J. Jackson, Jr., Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 13, 1990, Ser. No. 508,756

Int. Cl.[5] C08G 63/02, 63/00, 67/00, 69/00

U.S. Cl. 528—190 6 Claims

1. Process for the preparation of a poly(ester-carbonate) which comprises contacting (1) an aromatic diol, (2) methyl phenyl carbonate and (3) a carboxylate alkyl ester component selected from an aromatic dicarboxylate ester, a hydroxy aromatic carboxylate ester or a mixture thereof in the presence of a transesterification/polycondensation catalyst under transesterification/polycondensation conditions of pressure and temperature.

5,066,767

WHOLLY AROMATIC POLYESTERS COMPRISING ISOPHTHALIC ACID, TEREPHTHALIC ACID, P-HYDROXYBENZOIC ACID, HYDROQUINONE AND AN ARYLENE DIOL

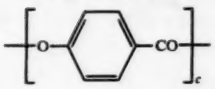
Markus Matzner, Edison, N.J., and Richard Layton, Augusta, Ga., assignors to Amoco Corporation, Chicago, Ill.

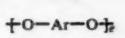
Continuation of Ser. No. 317,525, Mar. 1, 1989, abandoned. This application Dec. 18, 1989, Ser. No. 454,732

Int. Cl.[5] C08G 63/02, 63/18

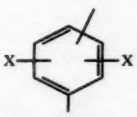
U.S. Cl. 528—193 11 Claims

1. A wholly aromatic polyester comprising the units (1)-(5)

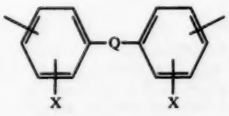




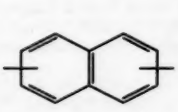
wherein Ar is at least one member selected from a divalent substituted mononuclear aromatic radical of the formula



wherein X is independently hydrogen, a C_1 to C_5 alkyl group, a halide atom or an aryl group; with the proviso that when the valence bonds are para to each other at least one group X must be other than hydrogen; a divalent dinuclear aromatic radical of the formula



wherein X is as previously defined and Q is at least one member selected from the group consisting of a chemical bond O, S, SO, S—S, SO_2, and CO; and a divalent naphthalene radical of the formula



or isomers thereof

and wherein a+b is approximately equal to d+e; the ratio of a to b being in the range of from about 1:4:1 to about 10:1; the ratio of d to e being in the range of from about 4:1 to about 21:1; and c being in the range of from about 0.6 to about 7, based on the total number of moles of a+b.

5,066,768

PREPARATION METHOD OF SPHERICAL MELAMINE RESIN PARTICULATES HAVING CROSSLINKED STRUCTURE

Saburo Hiraoka, Kasugai, and Kenji Niikawa, Nagoya, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,793

Claims priority, application Japan, Jun. 23, 1989, 1-159456

Int. Cl.[5] C08G *16/04*

U.S. Cl. 528—230 **6 Claims**

1. A preparation method of spherical melamine resin particulates having crosslinked structure comprising the steps of adding an acid catalyst to an aqueous solution containing at least 0.5 to less than 5% by weight of a melamine derivative which is polymerizable in the acid region, to adjust the pH of said aqueous solution to at least 4 to less than 5, and carrying out heat-treatment of the solution to complete particulate forming reaction of the melamine derivative.

5,066,769

CROSSLINKABLE RIGID-ROD AROMATIC HETEROCYCLIC POLYMER

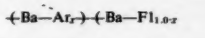
Robert C. Evers, and My Dotrong, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1990, Ser. No. 498,253

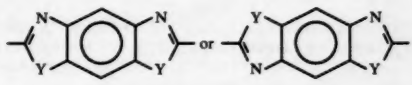
Int. Cl.[5] C08G *75/32*

U.S. Cl. 528—337 **5 Claims**

1. A para-ordered, rigid-rod aromatic heterocyclic copolymer having repeating groups of the formula:



wherein x has a value of 0.50 to 0.99, F1 is a 2,7-fluorene moiety, Ar is a para-ordered arylene group and Ba is a benzazole group of the formula:



wherein Y is S.

5,066,770

PROCESS AND APPARATUS FOR MANUFACTURING POLYMERS

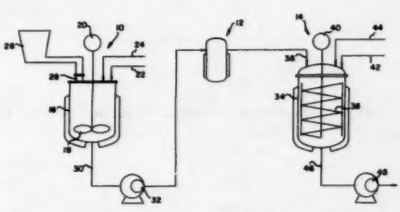
Takehiko Noguchi, Nagaokakyo; Takashi Sakubata, and Hirosaku Nagano, both of Ohtsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1989, Ser. No. 334,424

Claims priority, application Japan, Apr. 10, 1988, 63-87576; Apr. 11, 1988, 63-89462

Int. Cl.[5] C08G *69/26;* C08F *2/38*

U.S. Cl. 528—353 **12 Claims**



1. In a process for manufacturing a polymer by reacting two starting materials in the presence of an organic solvent, the improvement which comprises:

the first step of reacting a solution of a diamine in an organic

solvent with a tetracarboxylic dianhydride in the form of a powder to produce a reaction product having a viscosity of not greater than 500 poise; and

the second step of reacting a solution of the reaction product of said first step in an organic solvent with a solution of additional said dianhydride in an organic solvent.

5,066,771

METHOD FOR PRODUCING AN IMIDE OLIGOMER

Seiichi Hino, Yokohama; Shoichi Satou, Sagamihara; Kouji Koura, and Osamu Suzuki, both of Yokohama, all of Japan, assignors to Kozo Iizuka, Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

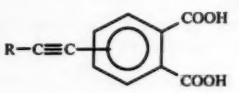
Continuation of Ser. No. 152,490, Feb. 5, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 502,741

Claims priority, application Japan, Feb. 10, 1987, 62-027219

Int. Cl.[5] C08G *69/26, 69/28, 8/02;* **C08F** *22/40*

U.S. Cl. 528—353 **10 Claims**

1. A method for producing an imide oligomer soluble in an organic solvent by reacting as three components (i) an aromatic tetracarboxylic acid or its derivative, (ii) an aromatic diamine and (iii) an end-capping agent, the molar ratio of said tetracarboxylic acid (i) to said diamine (ii) being 1 to 2, wherein the aromatic diamine is a condensation product of o-ethylaniline with formaldehyde, and the end-capping agent is an ethynyl phthalic acid of the formula:



[I]

wherein R is a hydrogen atom or a monovalent group selected from the group consisting of an aliphatic group, an alicyclic group and an aromatic group, or its derivative.

5,066,772

MEDICAL DEVICES FABRICATED TOTALLY OR IN PART FROM COPOLYMERS OF RECURRING UNITS DERIVED FROM CYCLIC CARBONATES AND LACTIDES

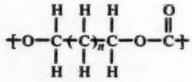
Reginald T. Tang, Warren; Frank Mares, Whippany; William J. Boyle, Jr., Parsippany; Tin-Ho Chiu, Millburn, and Kundan M. Patel, Landing, all of N.J., assignors to Allied-Signal Inc., Morristown, N.J.

Division of Ser. No. 226,706, Aug. 1, 1988, Pat. No. 4,916,193, which is a continuation-in-part of Ser. No. 134,321, Dec. 17, 1987, Pat. No. 4,891,263, and a continuation-in-part of Ser. No. 134,339, Dec. 17, 1987. This application Jan. 18, 1990, Ser. No. 467,067

Int. Cl.[5] C08G *63/64, 63/62*

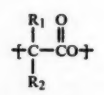
U.S. Cl. 528—354 **47 Claims**

1. A medical device formed totally or in part of one or more random copolymers having at least one type of recurring monomeric unit of the General Structure I:



Structure I

and having at least one type of recurring monomeric unit of the Structure II:



Structure II

wherein:

n is from 1 to about 8; and

R_1 and R_2 are the same or different and are hydrogen, alkyl or phenyl.

5,066,773

FORMATION OF POLY(BENZIMIDAZOLE)

Harry W. Gibson, and Yajnanarayana H. R. Jois, both of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

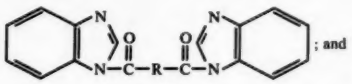
Filed Oct. 6, 1989, Ser. No. 418,313

Int. Cl.[5] C08G *73/18*

U.S. Cl. 528—362 **3 Claims**

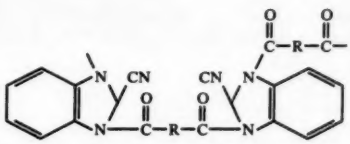
1. A process for forming a polymer which comprises:

(a) reaction of benzimidazole with an aliphatic diacid chloride to form bisbenzimidazole of the formula



; and

(b) reaction of the bisbenzimidazole with an aliphatic diacid chloride and cyanide to form the polymer having the repeating unit



where R is alkylene.

5,066,774

METHOD FOR THE PRODUCTION OF LIGHT COLORED AROMATIC SULFIDE/SULFONE POLYMERS WITH 1,3-DIALKYL-2-IMIDAZOLIDINONE DILUENT

Jon F. Geibel; Rex L. Bobsein, and Harold D. Yelton, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 458,043, Dec. 28, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 587,836

Int. Cl.[5] C08G *75/20*

U.S. Cl. 528—388 **10 Claims**

1. A process for preparing a poly(arylene sulfide/sulfone) polymer by reacting reactants comprising a dihalo aromatic sulfone with a sulfur-containing compound in the presence of an alkali metal carboxylate and a diluent consisting essentially of a 1,3-dialkyl-2-imidazolidinone, under polymerization conditions.

5,066,775

COPOLY ARYLENE/ALKYLENE SULFIDE

Ernst-Ulrich Dorf, Krefeld; Klaus Reinking, Wermelskirchen; Wolfgang Jakob, Moers; Erhard Tresper, Krefeld, and Wolfgang Rüsseler, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 5, 1990, Ser. No. 475,267

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904706

Int. Cl.[5] C08G *75/16*

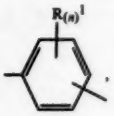
U.S. Cl. 528—388 **3 Claims**

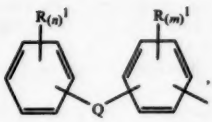
1. Sulphur-containing copolymer consisting essentially of

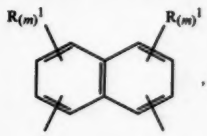
a) 60 to 99.5 mol % of identical or different arylene sulphide units of the formula (I)

—Ar—S— (I),

in which
Ar represents a radical of the formula (II), (III) or (IV)


(II)


(III)


(IV)

in which
R^1 denotes identical or different hydrogen, C_1–C_4-alkyl, C_5–C_{10}-cycloalkyl, C_6–C_{10}-aryl, C_7–C_{14}-alkylaryl or C_7–C_{14}-arylalkyl, or two R^1's in the ortho-position relative to one another together with the adjacent carbon atoms represent a C_5–C_{14}-ring which is aromatic or represent a C_5–C_{14} heterocyclic when the two R^1's are bridged by N, O or S hetero atoms,
Q represents a single bond or Q represents —CR^1_2—, —C(O)—, —S(O)—, —$S(O)_2$—, —NR^1—, —C(-C)O—, —C(O)NR^1—, (—$C(O))_2N$—, —C(O)N-R^1—Ar—$NR^1C(O)$— or —C(O)—AR—C(O)—, wherein R^1 and Ar are as defined supra,
n represents the number 1, 2 or 3 or 4,
m represents the number 1, 2 or 3,

b) 0.5 to 40 mol % of identical or different alkylene sulphide units and,

c) 0 to 3 mol % based on the sum of a) and b) of units of formula (VIII)

ArX_p (VIII),

in which
X represents halogen,
Ar represents a C_6–C_{24}-aromatic or -heteroaromatic and
p represents the number 3 or 4.

5,066,776

PROCESS FOR THE MANUFACTURE OF POLYARYLENE SULPHIDES

Wolfgang Rüsseler; Karsten-Josef Idel; Ernst-Ulrich Dorf; Wolfgang Alewelt, and Dieter Freitag, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 565,729

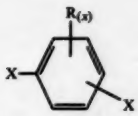
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927929

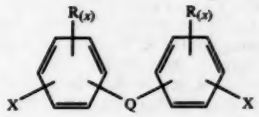
Int. Cl.[5] **C08G** *75/16*

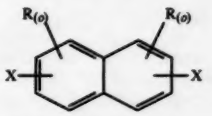
U.S. Cl. 528—388 **5 Claims**

1. A process for the manufacture of polyarylene sulphides from

a) dihalogen-(hetero)aromatic compounds of formulate (I), (II) or (III)


(I)


(II)


(III)

wherein
X signifies halogen,
R^1 is hydrogen, C_1–C_4 alkyl, C_5–C_{10} cycloalkyl, C_6–C_{10} aryl, C_7–C_{14} alkylaryl, C_7–C_{14} arylalkyl, or two R^1 residues together in the ortho position together with the adjacent carbon atoms in the ring form a C_5–C_{14} aromatic residue with or without up to three heteroatoms comprising N, O or S,
Q stands for a single bond or —CR^1_2—, —Ar—, —O—, —S—, —NR^1—, —C(O)—, —C(O)—Ar—C(O)—, —C(O)—NR^1—C(O)—, whereby R^1 has the meaning stated above and Ar stands for a C_6–C_{24} aromatic with or without a N, O or S heteroatom,
x stands for the numbers 1, 2, 3 or 4,
o stands for the numbers 1, 2 or 3,
whereby up to 20 mol % of the aromatic dihalogen residues are optionally replaced by C_1–C_{36} aliphatic dihalogen residues or C_8–C_{36} aromatic residues containing at least two aliphatically bound halogens,

b) optionally 0.05 to 3 mol %, relative to the sum of a), of tri- or tetrahalogen aromatic residues of formula (IV)

ArX_n (IV)

wherein
X stands for halogen,
Ar stands for C_6–C_{24} aromatic residue with or without up to 3 carbon atoms replaced by heteroatoms comprising O or S, and
n stands for the number 3 or 4, and optionally,
0.05 to 7.5 mol %, relative to the sum of a), of compounds for regulating the molecular weight,

c) alkali sulphides prepared in situ from alkali hydroxide and hydrogen sulphide, optionally with alkali hydrogen sulphides,

d) in a polar, aprotic organic solvent, characterized in that
i) a 1.8 to 2.4 molar amount, relative to the sum of aromatic dihalogen compounds in a), of alkali hydroxide is placed in a reactor with the polar solvent at room temperature and normal pressure or elevated pressure up to 10 bar, and
ii) optionally, with simultaneous heating, a 0.9 to 1.2 molar amount, relative to the sum of aromatic dihalogen compounds in a), of gaseous or condensed hydrogen sulphide is introduced, and
iii) heated to a temperature of at least 150° C.,
iv) the aromatic dihalogen compound(s) of a) are added, and
v) by azeotropic distillation the pressure of the aromatic dihalogen compounds at a minimum temperature corresponding to the boiling point of the water-containing azeotrope, water is separated in a period of 5–100 minutes, and

vi) the temperature is continuously increased to 230°–250° C.

5,066,777
POLYMERIZATION OF CO/OLEFIN WITH DIPHOSPHINE/HYDROCARBYL PALLADIUM SALT COMPLEX CATALYST

Petrus W. N. M. Van Leeuwen; Cornelis F. Roobeek, both of Amsterdam, Netherlands, and Pui K. Wong, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 5, 1990, Ser. No. 474,959
Claims priority, application Netherlands, Mar. 15, 1989, 8900629
Int. Cl.[5] C08G 67/02
U.S. Cl. 528—392 9 Claims

1. In the process for the production of linear alternating polymers of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon under polymerization conditions in the presence of a reaction diluent and a catalytic quantity of a diphosphine/hydrocarbylpalladium salt complex, the improvement wherein the complex comprises a tetraaryldiphosphine/hydrocarbylpalladium cation and the anion of a non-hydrohalogenic acid having a pKa below 2.

5,066,778
CARBON MONOXIDE/CYCLOPENTEN COPOLYMER AND PREPARATION WITH AROMATIC DINITRO COMPOUND

Josephus H. Van Deursen; Johannes A. Van Doorn; Eit Drent, all of Amsterdam, Netherlands, and Pui K. Wong, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 30, 1990, Ser. No. 472,146
Claims priority, application Netherlands, Mar. 2, 1989, 8900513
Int. Cl.[5] C08G 67/02
U.S. Cl. 528—392 10 Claims

1. A process for producing a linear alternating copolymer of carbon monoxide and a cyclopentene compound having a hydrogen substituent on each carbon atom of the carbon-carbon double bond, which comprises contacting the carbon monoxide and cyclopentene in a reaction diluent under polymerization conditions, in the presence of a catalyst composition formed from a palladium compound, an anion of a non-hydrohalogenic acid having a pKa below 2, a bidentate ligand, and an aromatic m-dinitro compound.

5,066,779
CATALYTIC PROCESS FOR PRODUCING RAW MATERIAL PITCH FOR CARBON MATERIALS FROM NAPHTHALENE

Ikuo Seo, Iwaki; Tooru Oono, Fujushima, and Yosinobu Murakami, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 30, 1990, Ser. No. 472,260
Claims priority, application Japan, Feb. 2, 1989, 1-24592
Int. Cl.[5] C08G 61/10, 83/00
U.S. Cl. 528—396 11 Claims

1. A process for producing a raw material pitch for carbon materials comprising the steps of:

adding aluminum chloride to naphthalene or naphthalene derivative as a catalyst; polymerizing said naphthalene or naphthalene derivative at a temperature of 100° to 330° C. to obtain a polymer; adding water to said polymer to obtain a mixture thereof; maintaining said mixture in an emulsified state for a predetermined time under stirring and removing water containing a residual catalyst from said polymer.

5,066,780
METHOD OF VULCANIZING RUBBER WITH HEAT TRANSFER LIQUID

Werner Michel, Emmering, Fed. Rep. of Germany, assignor to Metzeler GmbH, Munich, Fed. Rep. of Germany

Filed Oct. 12, 1989, Ser. No. 420,167
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1988, 3834772; Aug. 1, 1989, 3925482
Int. Cl.[5] C08C 19/20
U.S. Cl. 528—481 9 Claims

1. Method of vulcanizing strands of rubber profiles, which comprises:

preparing a salt melt of potassium nitrate including a content of lithium nitrate and having a viscosity lower than 40 mPa×s,

heating the salt melt to a temperature substantially between 180° and 260°, and

continuously passing the strands of rubber profiles through the salt melt and vulcanizing the strands of rubber profiles.

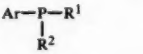
5,066,781
HEAT TREATED POLYARYLENE SULPHIDE CONTAINING PHOSPHINE GROUPS

Burkhard Köhler, and Rolf-Volker Meyer, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 436,127, Nov. 13, 1989, Pat. No. 5,010,169, which is a division of Ser. No. 336,716, Apr. 12, 1989, abandoned. This application Jul. 16, 1990, Ser. No. 552,808
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1988, 3714533
Int. Cl.[5] C08G 75/16
U.S. Cl. 528—481 4 Claims

1. Linear or branched phosphorous containing polyarlene sulphide prepared by:

a. the reaction of 0.1 to 10 mol-% of at least one monomer corresponding to the following formula



(I)

wherein

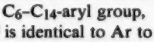
P denotes phosphorous,

Ar denotes a C_6–C_{14} aromatic group or a C_5–C_{14} heteroaromatic group containing 1 to 3 halogen atoms,

R^1 is identical to Ar or denotes a C_1–C_{22}-alkyl, C_6–C_{15}-aralkyl or C_6–C_{14}-aryl group,

R^2 is identical to Ar to R^1,

from 90 to 99.9 mol-% of at least one monomer corresponding to the formula II



(II)

wherein

Ph represents a para- or metaphenylene group of a 4,4'-diphenylene group and

Hal represents halogen and the sum of all the halogen atoms is at least 2, and 1 to 2 equivalents of an alkali metal sulfide and

b. the subsequent heating of the isolated reaction product of step a. to 280°–450° C. for 1–100 minutes.

5,066,782

RETROVIRUS CAPABLE OF CAUSING AIDS, MEANS AND METHOD FOR DETECTING IT IN VITRO

Luc Montagnier, Le Plessis Robinson; Solange Chamaret, Paris; Denise Guetard, Paris; Marc Alizon, Paris; Francois Clavel, Paris; Mireille Guyader, Paris; Pierre Sonigo, Paris; Francoise Brun-Vezinet, Paris; Marianne Rey, Paris; Christine Rouzioux, Paris, and Christine Katlama, Paris, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 150,645, Nov. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 3,764, Jan. 16, 1987, which is a continuation-in-part of Ser. No. 933,184, Nov. 21, 1986, which is a continuation-in-part of Ser. No. 916,080, Oct. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 835,228, Mar. 3, 1986, Pat. No. 4,839,288. This application Jan. 10, 1990, Ser. No. 462,908

Claims priority, application France, Jan. 22, 1986, 86 00910; Jan. 22, 1986, 86 00911; Feb. 6, 1986, 86 01635; Feb. 13, 1986, 86 01985; Mar. 18, 1986, 86 03881; Mar. 24, 1986, 86 04215; Jan. 22, 1987, PCT/FR87/00025

Int. Cl.[5] C07K *13/00, 15/14, 15/04*

U.S. Cl. 530—324 8 Claims

1. Antigen of Human Immunodeficiency Virus Type 2 (HIV-2), wherein the antigen is selected from the group consisting of p12 protein and p42 protein, and wherein the antigen is substantially pure and is capable of specifically reacting with antibodies serum of a patient afflicted with Lymphadenopathy Syndrome (LAS) or Acquired Immune Deficiency Syndrome (AIDS).

5,066,783

ANTIVIRAL PEPTIDES AND MEANS FOR TREATING HERPES INFECTIONS

Eric A. Cohen, 2175 Stevens, St. Laurent, Quebec, Canada H4M 1G6 ; Pierrette Gaudreau, 776 Andrien, Greenfield Park, Quebec, Canada J4V 3L4 ; Jacques Michaud, 115 Ste. Catherine, O. Apt. #302, Montreal, Quebec, Canada H2V 4R3 ; Paul Brazeau, 12460 Odette Oligny, Cartierville, Montreal, Quebec, Canada H4J 9Z7 , and Yves Langelier, 4671 Christophe Colomb, Montreal, Quebec, Canada H2J 3G7

Continuation-in-part of Ser. No. 46,707, May 7, 1987, Pat. No. 4,795,740. This application Sep. 15, 1988, Ser. No. 244,879

The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.

Int. Cl.[5] C07K *7/06*

U.S. Cl. 530—328 1 Claim

1. A polypeptide selected from a group consisting of the following polypeptide

(18-1)
H—Tyr—Ala—Gly—Thr—Val—Ile—Asn—Asp—Leu—OH,

(18-2)
Ac—Tyr—Ala—Gly—Thr—Val—Ile—Asn—Asp—Leu—OH,

(18-3)
Ac—Tyr(OAc)—Ala—Gly—Phe—Val—Ile—Asn—Asp—Leu—OH,

(18-4)
Ac—Tyr—Ala—Gly—Ser—Val—Ile—Asn—Asp—Leu—OH,

(18-5)
Ac—Tyr—Ala—Gly—Val—Val—Ile—Asn—Asp—Leu—OH,

(18-6)
Ac—Tyr—Ala—Gly—Cys—Val—Ile—Asn—Asp—Leu—OH,

(18-7)
Ac—Tyr—Ala—Ala—Thr—Val—Ile—Asn—Asp—Leu—OH,

(18-8)
Ac—Tyr—Ala—Val—Thr—Val—Ile—Asn—Asp—Leu—OH,

(18-9)
Ac—Tyr—Ser—Gly—Thr—Val—Ile—Asn—Asp—Leu—OH,

-continued

(18-10)
Ac—Tyr—Cys—Gly—Thr—Val—Ile—Asn—Asp—Leu—OH,

(18-11)
Ac—Tyr—Ala—Gly—Phe—Val—Ile—Asn—Asp—Leu—OH,

(18-12)
Ac—Tyr—Ala—Pro—Ala—Val—Ile—Asn—Asp—Leu—OH,

Ac—Tyr—Ser—Val—Ile—Asn—Asp—Leu—OH, (18-13)

Ac—Phe—Val—Ile—Asn—Asp—Leu—OH, (18-14)

desamino—Tyr—Val—Ile—Asn—Asp—Leu—OH, (18-15)

Ac—Tyr—Val—Ile—Asn—Asp—Leu—OH, (18-16)

and

Ac—Tyr(OMe)—Val—Ile—Asn—Asp—Leu—OH, (18-17)

or a therapeutically acceptable salt of said polypeptide.

or a therapeutically acceptable salt of said polypetide.

5,066,784

METHOD FOR USING SUBSTRATE IN PEPTIDE SYNTHESES

David C. Sherrington, Kirkintilloch, Scotland, and Philip W. Small, Merseyside, United Kingdom, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Division of Ser. No. 185,672, Apr. 25, 1988, Pat. No. 4,965,289. This application May 25, 1990, Ser. No. 528,492

Claims priority, application United Kingdom, Apr. 24, 1987, 8709689; Nov. 24, 1987, 8727474

Int. Cl.[5] A61K *37/02;* C07K *5/00*

U.S. Cl. 530—334 10 Claims

1. A process of peptide synthesis using a substrate comprising a porous cross-linked vinyl polymeric material having a pore structure providing an open porosity of at least 75% and comprising cells having a diameter in the range 1 to 100 μm interconnected by holes and a gel contained and retained in said pore structure by chemical binding to the surfaces of the said polymeric material, said gel being polymeric and having reactive functional groups used in the peptide synthesis, said cells and holes of said polymeric material having a shape and conformation resulting from polymerization of vinyl material in a high internal phase emulsion system, said peptide synthesis comprising sequentially passing reagents through the pore structure of said substrate so as to perform the steps of

a) chemically bonding a first amino acid residue to said gel via said reactive functional groups of said gel;

b) chemically bonding a second amino acid residue to said first amino acid residue to form a peptide chain;

c) chemically bonding further amino acids sequentially to increase said peptide chain; and

d) chemically cleaving the peptide resulting from step c) from said gel.

5,066,785

CARBOXYL TERMINAL PEPTIDE AND PROTEIN SEQUENCING

Chad G. Miller, Los Angeles, Calif., assignor to City of Hope, Duarte, Calif.

Continuation-in-part of Ser. No. 271,328, Nov. 15, 1988, Pat. No. 4,935,494. This application Feb. 17, 1989, Ser. No. 311,966

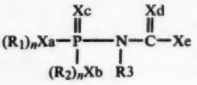
The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] C07K *1/10*

U.S. Cl. 530—345 10 Claims

1. In a process for the sequential degradation of a peptide which includes reacting the carboxy terminus of said peptide with a coupling reagent to form a peptidyl derivative which is

cleavable to provide a derivative of the amino acid residue previously at said carboxy terminus and a peptide lacking such amino acid residue, the improvment which comprises utilizing, as the coupling reagent, a compound of the schematic structural formula:



in which

Xa and Xb are O (oxygen), S (sulfur) or N (nitrogen)

R_1 and R_2 are H, or any alkyl ar aryl radical having not more than about 10 carbon atoms,

n is 1 when Xa and Xb are O or S;

n is 2 when Xa or Xb is N

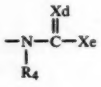
when Xa and Xb are both N $(R_1)_nXa$ and $(R_2)_nXb$ may be included in an acylic amine or a nitrogen heterocycle;

R_4 is an alkyl or aryl radical having not more than about 10 carbon atoms:

Xc is O or S

Xd is O, S or NR_4 wherein R_4 is H or any alkyl or aryl radical having not more than about 10 carbon atoms

Xe is OR_5, SR_5 or $N(R_5)_2$ wherein R_5 is an alkyl or aryl radical having not more than about 12 carbon atoms, and in which



may be included in a ring system

5,066,786

METHOD FOR THE PURIFICATION OF INTERFERON

Otello Protasi, and Paolo Rappuoli, both of Siena, Italy, assignors to Sclavo, S.p.A., Siena, Italy

Filed Jul. 18, 1988, Ser. No. 220,312

Claims priority, application Italy, Jul. 31, 1987, 21560 A/87

Int. Cl.[5] C07K *15/26, 3/18, 3/20*

U.S. Cl. 530—351 **12 Claims**

1. A method for the purification of human interferon from solutions containing it, the method comprising the steps of

a) providing a column of siliceous material;

b) disinfecting said column with an aqueous solution of formaldehyde;

c) passing an interferon solution through said column to substantially completely adsorb said interferon;

d) washing the column with non-pyrogenic, sterile, deionized water;

e) eluting of the column successively with a 1.4 M aqueous solution of Nacl in non-pyrogenic, sterile, deionized water, and with an aqueous solution of acetic acid having a molar concentration of from 0.001 M to 0.003 M, to remove residual extraneous proteins;

f) eluting of the column with an aqueous solution of acetic Acid having a molar concentration of from 0.01 to 0.03 M, to obtain a fraction or fractions of the interferon from the column; and

g) recovering and lyophilizing the fraction or fractions containing the interferon thus purified.

5,066,787

BLOOD COAGULATION INHIBITING PROTEINS, PROCESSES FOR PREPARING THEM AND THEIR USES

Christian P. M. Reutelingsperger, Maastricht, Netherlands, assignor to Boehringer Ingelheim International GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 779,287, Sep. 23, 1985, Pat. No. 4,736,018. This application Nov. 23, 1987, Ser. No. 123,970

Claims priority, application Netherlands, Sep. 21, 1984, 8402904; Mar. 4, 1985, 8500601

Int. Cl.[5] C07K *15/06;* **A61K** *37/02*

U.S. Cl. 530—380 **18 Claims**

1. A substantially purified anti-coagulant protein, having an anti-coagulation activity, belonging to the group of vascular anti-coagulants which do not inactivate the coagulation factors, wherein said anti-coagulant protein inhibits:

(1) a modified prothrombin-time experiment;

(2) a modified, activated, partial thromboplastin-time experiment;

(3) a non-modified prothrombin-time experiment;

(4) prothrombin activation by coagulation factor X_a in the presence of negatively charged phospholipids and Ca^{2+};

(5) intrinsic X-activation by factor IX_a in the presence of negatively charged phospholipids and Ca^{2+};

(6) prothrombin activation of isolated, stimulated blood platelets;

(7) coagulation induced by blood vessel walls; and

(8) coagulation-dependent aggregation of platelets; and

wherein said anti-coagulant protein does not inhibit the biological and amidolytic activity of factors X_a and II_a, per se; and wherein said anti-coagulant protein inhibits coagulation induced by a vascular coagulant or by factor X_a, but does not inhibit coagulation of thrombin.

5,066,788

BLOOD COAGULATION INHIBITING PROTEINS, PROCESSES FOR PREPARING THEM AND THEIR USES

Christian M. Reutelingsperger, Maastricht, Denmark, assignor to Boehringer Ingelheim International GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 123,970, Nov. 23, 1987, which is a division of Ser. No. 779,287, Nov. 23, 1985, Pat. No. 4,736,018. This application Dec. 7, 1989, Ser. No. 447,065

Claims priority, application Netherlands, Sep. 21, 1984, 8402904; Mar. 4, 1985, 8500601

Int. Cl.[5] C07K *15/06;* **A61K** *37/02*

U.S. Cl. 530—381 **1 Claim**

1. A substantially purified anti-coagulant protein obtainable from the walls of mammalian blood vessels and belonging to the group of vascular anti-coagulants which inhibit the coagulation induced by a vascular coagulant or by factor X_a, but does not inactivate the coagulation factors, inhibit the biological and amidolytic activity of factors X_a and II_a, or inhibit coagulation induced by thrombin.

5,066,789

TARGETING SUBSTANCE-DIAGNOSTIC/THERAPEUTIC AGENT CONJUGATES HAVING SCHIFF BASE LINKAGES

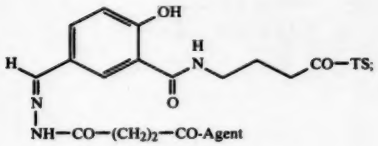
Ananthachari Srinivasan, Kirkland; Diana I. Brixner, Lynnwood; Vivekananda M. Vrudhula, Edmonds, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

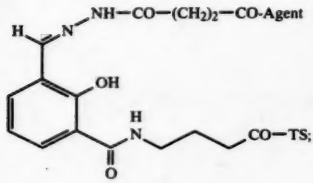
Continuation-in-part of Ser. No. 252,298, Sep. 30, 1988, abandoned. This application Sep. 29, 1989, Ser. No. 415,154

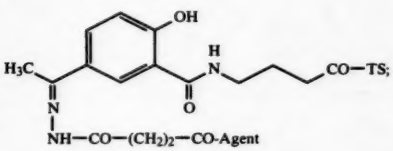
Int. Cl.[5] C07K *15/28*

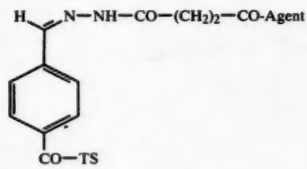
U.S. Cl. 530—388 **4 Claims**

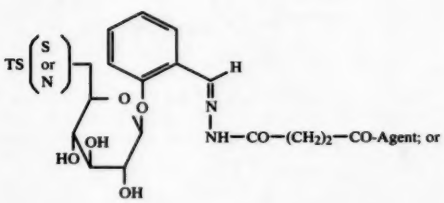
1. A targeting substance-diagnostic/therapeutic agent conjugate joined by a hydrazone linker and having the formula:

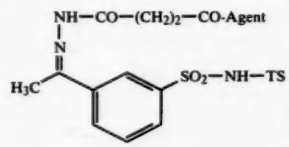












wherein "TS" represents a targeting substance and "Agent" represents a diagnostic or therapeutic agent.

5,066,790

METHOD OF PRODUCING STAR-LIKE POLYMERS FROM LIGNIN

Wolfgang G. Glasser; Willer De Oliveira, both of Blacksburg, Va.; Stephen S. Kelley, Kingsport, Tenn., and Li S. Nieh, Blacksburg, Va., assignors to Center for Innovative Technology, Herndon and Virginia Polytechnic Institute and State University, Blacksburg, both of, Va.

Division of Ser. No. 7,183,213, Apr. 19, 1988, Pat. No. 4,918,167. This application Jan. 4, 1990, Ser. No. 460,989

Int. Cl.[5] C07G *1/00*; C08L *97/00*

U.S. Cl. 530—502 **19 Claims**

1. A method of preparing a prepolymer having multiple functionality comprising:

dissolving a lignin derivative comprising an alkylene oxide modified lignin in a solvent;

admixing a chain extending agent to the mixture under non-aqueous conditions in the presence of a catalyst, at a temperature and pressure sufficient to react the chain extending agent and the lignin, to produce a chain extended lignin derivative; and

then removing the solvent and any remaining chain extending agent to isolate the chain extended lignin derivative.

5,066,791

PYRIDONEAZO DYES WITH AN M-AMINOBENZOIC ESTER AS THE DIAZO COMPONENT

Guenter Hansen, Ludwigshafen; Gunther Lamm, Hassloch, and Hermann Loeffler, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

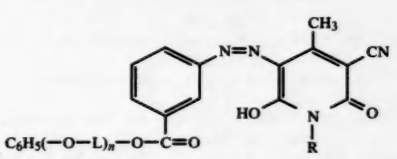
Continuation of Ser. No. 263,884, Oct. 28, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 480,359

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736817

Int. Cl.[5] C09B *29/42*; D06D *3/52*

U.S. Cl. 534—772 **2 Claims**

1. A pyridoneazo dye of the formula I



(I)

where L is ethylene, R is methyl or ethyl and n is 1.

5,066,792

GENE PROBE FOR DETECTION OF SPECIFIC HUMAN LEUKEMIAS

Grady F. Saunders, and Wendy M. Mars, both of Houston, Tex., assignors to Board of Regents University of Texas, Austin, Tex.

Continuation-in-part of Ser. No. 94,099, Sep. 4, 1987, Pat. No. 4,857,466, which is a continuation of Ser. No. 655,942, Sep. 28, 1984, abandoned. This application Dec. 2, 1988, Ser. No. 279,451

Int. Cl.[5] C07H *21/04*; C12Q *1/68*

U.S. Cl. 536—27 **3 Claims**

1. A nucleic acid probe having a sequence consisting essen-

tially of that found in the transformed *E. coli* which is designated ATCC no. 39868 and which encodes a protein for which

the corresponding mRNA is highly expressed in chronic myelogenous leukemia.

5,066,793

FINELY PARTICULATE CELLULOSE ESTERS OF AROMATIC OR AROMATIC-ALIPHATIC CARBOXYLIC ACIDS, PROCESS FOR THEIR PREPARATION, AND THE USE THEREOF

Eric Francotte, Kaiseraugst, Switzerland, and Gabriele Baisch, Weil-Friedlingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1988, Ser. No. 257,363

Claims priority, application Switzerland, Oct. 26, 1987, 4202/87; Jun. 24, 1988, 2431/88

Int. Cl.[5] C08B *3/12, 3/26, 3/28*

U.S. Cl. 536—50 **18 Claims**

1. Cellulose ester particles of an aromatic or aromatic-aliphatic carboxylic acid having an average diameter of 1 to 200 μm, a specific surface area of 10 to 300 m^2/g, and a heat of fusion determined by calorimetry of 1 to 50 J/g, resulting from the process which comprises

(a) adding a solution of a cellulose ester of an aromatic or aromatic-aliphatic carboxylic acid in an organic solvent that contains 1 to 50% by volume, based on the amount of the solvent, of a C_5–C_{22}alkanol to a solution of an anionic surfactant in water,

(b) removing the organic solvent with continued stirring

(c) isolating, washing and drying the solid particles.

5,066,794

PROCESS FOR PREPARING A DISACCHARIDE DERIVATIVE

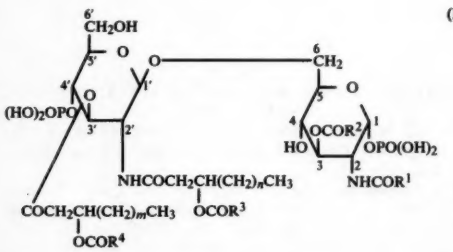
Tetsuo Shiba, Osaka, Japan, assignor to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 342,639, Apr. 19, 1989, abandoned, which is a continuation of Ser. No. 769,289, Aug. 26, 1985, abandoned. This application Jan. 29, 1990, Ser. No. 471,064

Int. Cl.[5] C07H *5/06, 1/02*

U.S. Cl. 536—55.3 **3 Claims**

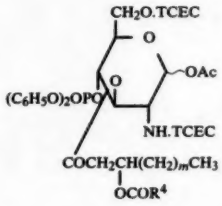
1. A process for preparing a disaccharide derivative represented by formula (I)



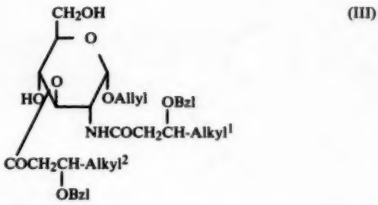
(I)

wherein R^1CO— and R^2CO— each represents a residue of a straight chain fatty acid having from 8 to 20 carbon atoms and having a hydroxyl group at the 3-position thereof; R^3CO— and R^4CO— each represents a residue of a straight chain fatty acid having from 8 to 20 carbon atoms; and m and n each represents an integer of from 8 to 12, and a salt thereof, comprising

A) condensing a compound of the formula (II):

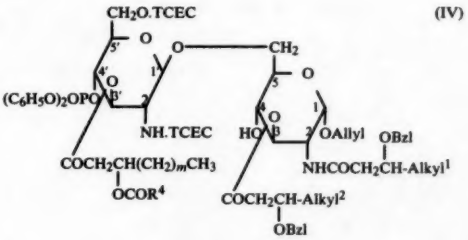


with a compound of formula (III)



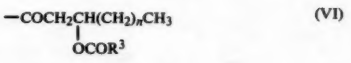
(III)

to obtain a compound of the formula (IV)



(IV)

B) removing TCEC groups bonded to the 2′-amino group and the 6-hydroxyl group of compound (IV), and, at the same time, bonding a group represented by the formula (VI)

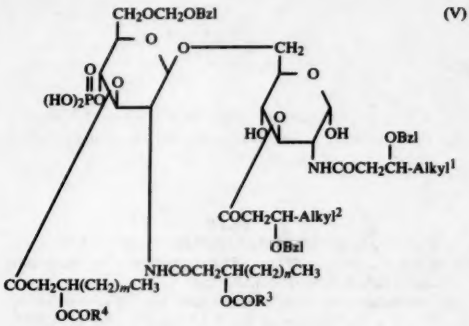


(VI)

to the 2′-amino group,

C) protecting the 6′-hydroxyl group with a protecting group for hydroxyl group,

D) removing the protecting allyl group at the 1-hydroxyl group to obtain a compound represented by formula (V)



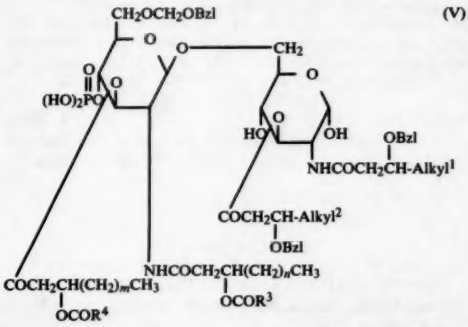
(V)

and

E) reacting the compound of formula (V) with dibenzyl phosphorochloridate to introduce a phosphono group into the 1-hydroxyl group, and then removing the benzyl group protecting functional groups by catalytic reduction to obtain the compound of formula (I);

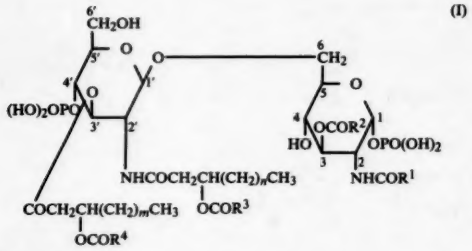
wherein the foregoing formulae TCEC represents a trichloroethoxycarbonyl group; Allyl represents an allyl group; Ac represents an acetyl group; Bzl represents a benzyl group; $Alkyl^1$ and $Alkyl^2$ each represents an alkyl group having from 5 to 17 carbon atoms; and R^3CO—, R^4CO—, and m and n each is the same as defined above for the formula (I).

3. A process for preparing a disaccharide derivative comprising reacting a compound of formula (V)



(V)

with dibenzyl phosphorochloridate to introduce a phosphono group into the 1-hydroxyl group, and then removing the benzyl group protecting functional groups by catalytic reduction to obtain a compound of formula (I)



(I)

wherein Bzl represents a benzyl group, $Alkyl^1$ and $Alkyl^2$ each represents an alkyl group having from 5 to 17 carbon atoms, R^1CO— and R^2CO— each represents a residue of a straight chain fatty acid having from 8 to 20 carbon atoms and having a hydroxyl group at the 3—position thereof, R^3CO— and R^4CO— each represents a residue of a straight chain fatty acid having from 8 to 20 carbon atoms, and m and n each represents an integer of from 8 to 12, and a salt thereof.

5,066,795

PERFLUOROALKYL-CONTAINING COMPOUND

Teruo Umemoto, and Sumi Ishihara, both of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

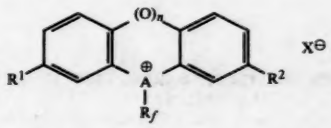
Filed Feb. 7, 1990, Ser. No. 476,542

Claims priority, application Japan, Feb. 10, 1989, 1-29705; Apr. 18, 1989, 1-96325

Int. Cl.[5] C07D *329/00, 345/00, 333/76, 327/04*

U.S. Cl. 540—1 **6 Claims**

1. A (perfluoroalkyl)dibenzonium salt represented by the following general formula



(I)

wherein R_f represents a perfluoroalkyl group having 1 to 10 carbon atoms, A represents a sulfur or selenium atom, R^1 and R^2, independently from each other, represents a hydrogen atom or a nitro group, $X^{\ominus}$ represents a conjugated base of Brönsted acid, and n is 0 or 1.

5,066,796

ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH BICHROMOPHORIC BISAZO PHTHALOCYANINE PHOTOCONDUCTIVE MATERIALS

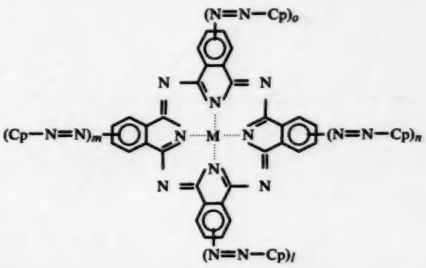
Kock-Yee Law, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1990, Ser. No. 531,378

Int. Cl.[5] G03G *5/06*

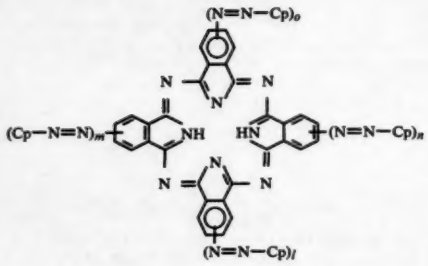
U.S. Cl. 540—140 **22 Claims**

1. An imaging member which comprises a conductive substrate and a photogenerator layer containing a photogenerating compound selected from the group consisting of:



I

-continued



II

and mixtures thereof, wherein Cp represents a coupler group, l, m, n, and o can each be 0, 1, 2, 3, or 4, the sum of l, m, n, and o is from 1 to 8, and M is selected from the group consisting of metals, metal oxides, metal halides, and metal hydroxy compounds.

5,066,797

PROCESS FOR PREPARING CEPHAM INTERMEDIATES

Jack E. Baldwin, Hinksey Hill, England, assignor to Lilly Industries Limited, Hampshire, England

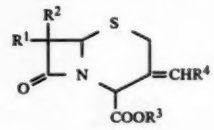
Filed Jul. 10, 1989, Ser. No. 377,371

Claims priority, application United Kingdom, Jul. 12, 1988, 8816546

Int. Cl.[5] C07D *501/04*

U.S. Cl. 540—215 **8 Claims**

1. A process for preparing a compound of the formula



(I)

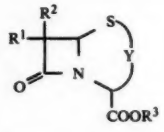
in which

R^1 is an amino group, a protected amino group, an acylamino group or a diacylamino group,

R^2 is hydrogen, C_{1-4} alkoxy or C_{1-4} alkylthio,

R^3 is hydrogen, a salt ion or an ester-forming group, and

R^4 is hydrogen or C_{1-3} alkyl, which comprises reacting a compound of the formula



(II)

in which Y is a bridging group of the formula

or

-continued

Z is chloro, bromo or iodo, and R^1, R^2, R^3 and R^4 have the above defined values, with a reagent providing cobalt I, under reducing conditions.

5,066,798

CRYSTALLINE CEPHALOSPORIN DERIVATIVE

Bernhard C. Prager, Wörgl, Austria, assignor to Biochemie Gesellschaft m.b.H., Tyrol, Austria

Continuation of Ser. No. 458,279, Dec. 28, 1989, abandoned, which is a continuation of Ser. No. 336,278, Apr. 11, 1989, abandoned, which is a division of Ser. No. 57,552, Jun. 3, 1987, Pat. No. 4,826,972. This application Jun. 15, 1990, Ser. No. 538,795

Claims priority, application Austria, Jun. 4, 1986, 1511/86

Int. Cl.[5] C07D *501/38;* A61K *31/545*

U.S. Cl. 540—225 **2 Claims**

1. Crystalline (6R, 7R)-7 -2-(2-Amino-4-thiazolyl)-(Z)-2-(1-diphenylmethoxycarbonyl-1-methylethoxy)imino acetamido -3-(1-pyridiniummethyl)-3-cephem-4-carboxylate.

5,066,799

INTERMEDIATES FOR THE PREPARATION OF AMINOTHIAZOLOXIMINO CEPHALOSPORINS

William V. Curran, Pearl River, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 375,108, Jun. 30, 1989, Pat. No. 4,959,495, which is a division of Ser. No. 163,599, Mar. 3, 1988, abandoned, which is a division of Ser. No. 890,000, Jul. 28, 1986, abandoned. This application Jun. 29, 1990, Ser. No. 546,136

Int. Cl.[5] C07D *501/36*

U.S. Cl. 540—226 **4 Claims**

1. 7-[4-chloro-2-(Z)-methoxyimino-3-oxobutyramido]-3[(1,2,3-thiadiazol-5-yl)thiomethyl]ceph-3-em-4-carboxylic acid.

5,066,800

QUNOLINE INTERMEDIATES USEFUL THEREIN FOR SYNTHESIZING ANTIBACTERIAL COMPOUNDS

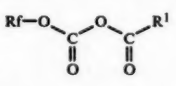
Masami Okabe, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 27, 1990, Ser. No. 515,958

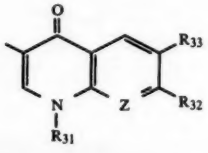
Int. Cl.[5] C07D *471/06, 245/00, 487/06, 239/28, 239/00*

U.S. Cl. 540—471 **7 Claims**

1. A compound of the formula



wherein R^1 is a group of the formula



wherein Z is

or N, R_{30} is hydrogen or halogen; R_{31} is hydrogen, halogen, lower alkyl, lower alkenyl, C_3–C_7 cycloalkyl, halo lower alkyl or mono, di and tri-halophenyl; R_{30} and R_{31} when taken together represent lower alkylene of 3–5 carbon atoms, a lower alkylene mono-oxy group of 2–4 carbon atoms or a lower alkylene dioxy group having 1–2 carbon atoms; R_{32} is hydrogen, halogen, lower alkyl, a 5 or 6 membered heterocyclic ring containing 1–3 hetero atoms selected from the group consisting of O, N and S, the heterocyclic ring being unsubstituted or substituted with lower alkyl, lower alkoxy, halogen, halo substituted lower alkyl, amino lower alkyl, lower alkyl amino lower alkyl, amino, mercapto, hydroxy, carbamoyl or carboxy; R_{33} is hydrogen or halogen; R_{32} and R_{33} when taken together represent a C_1–C_4 lower alkylene dioxy group; and R_f is (i) alkyl or alkenyl, either of which may be unsubstituted or substituted with at least one halo, amino or cyano, (ii) aryl which may be unsubstituted or substituted with at least one halo, hydroxy, lower alkyl, amino, cyano, lower alkoxy or alkoxycarbonyl, (iii) aralkyl, or (iv) cycloalkyl which may be unsubstituted or substituted with at least one lower alkyl or lower alkenyl group.

5,066,801

PREPARATION OF SULFONIC ACID ESTERS

Hans-Ulrich Blaser, Ettingen; Hans-Peter Jalett, Dornach, and Gottfried Sedelmeier, Schallstadt, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 320,902, Mar. 7, 1989, abandoned, which is a continuation of Ser. No. 129,576, Dec. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 869,799, Jun. 2, 1986, Pat. No. 4,785,089. This application Jun. 26, 1990, Ser. No. 544,076

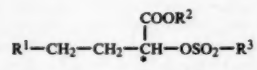
Claims priority, application Switzerland, Jun. 13, 1985, 2501/85

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[5] **C07D** *223/16*

U.S. Cl. 540—523 **32 Claims**

1. A process for the preparation of a compound of formula I



(I)

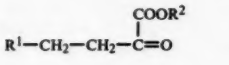
wherein

R^1 is C_5–C_6 cycloalkyl which is unsubstituted or substituted by C_1–C_7 alkyl or unsubstituted or substituted phenyl;

R^2 is C_1–C_7 alkyl;

R^3 is phenyl which is substituted by halogen or nitro; and the asterisk denotes a carbon atom that is either present in the preponderant number of molecules in the S configuration or in the preponderant number of molecules in the R configuration,

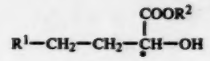
comprising enantio-selectively reducing a compound of formula III



(III)

wherein

R^1 and R^2 are as defined for formula I, in the presence of (a) a platinum catalyst on an alumina carrier and (b) a cinchona alkaloid, to a compound of formula II



(II)

wherein

R^1, $R_2{}^2$ and the asterick are as defined for formula I, and reacting said compound of formula II with an R^3-sulfonyl-anhydride or an R_3-sulfonyl-halide, wherein R_3 is defined as above.

5,066,802

PROCESS FOR PREPARING PYRIDO-BENZOTHIAZINE DERIVATIVES HAVING HIGH ANTIBACTERIAL ACTIVITY AND HIGH BIOAVAILABILITY TO TISSUES

Patrizia Terni; Stefano Maiorana; Antonio Papagni, and Piergiuseppe Pagella, all of Milan, Italy, assignors to Mediolanum Farmaceutici Srl., Milan, Italy

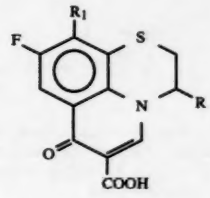
Continuation of Ser. No. 251,457, Sep. 30, 1988, Pat. No. 4,923,859. This application Dec. 7, 1989, Ser. No. 447,406

Claims priority, application Italy, Oct. 6, 1987, 22156 A/87

Int. Cl.[5] **C07D** *279/02*

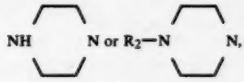
U.S. Cl. 544—32 **11 Claims**

1. A process for preparing pyrido-benzothiazine derivatives possessing high antibacterial activity and tissue bio-availability, having the formula:

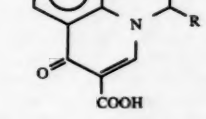


(I)

in which R is H or a C_1–C_6 alkyl or a C_1–C_6 fluoroalkyl, and R_1 is N-alkyl-3-pyrrolidynalkylamine with C_1 to C_6 alkyls or

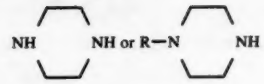


where R_2 is a C_1–C_6 alkyl or a C_2–C_6 alkenyl or a lower hydrocarbyl arylalkyl, unsubstituted or substituted by halogen, hydroxy or keto-groups, wherein the intermediate compound



(XXXV)

in which R has the above defined meaning, is prepared through a first reaction cycle starting from 2,4-difluoro-3-chloronitrobenzene, and that, through a second reaction cycle, the nucleophilic substitution of chlorine atom in (XXXV) with a N-alkyl-3-pyrrolidinalkylamine or with



is carried out and successively the sulphoxide group is reduced to sulfide.

5,066,803

2- AND 3-AMINOMETHYL-6-ARYLCARBONYL-2,3-DIHYDROPYRROLO[1,2,3-DE]-1,4-BENZOXAZINES

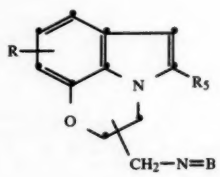
Thomas E. D'Ambra, North Greenbush, and Malcolm R. Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 447,469, Dec. 7, 1989, Pat. No. 4,939,138, Continuation-in-part of Ser. No. 291,905, Dec. 29, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 509,441

Int. Cl.[5] C07D *413/04*

U.S. Cl. 544—101 **4 Claims**

1. A member of the group consisting of (A) compounds having the formula



where:

R is hydrogen or from one to two substituents selected from the group consisting of lower-alkyl, lower-alkoxy, hydroxy or halogen in the 7-, 8-, or 9-positions;

R_5 is hydrogen or lower-alkyl; and

N=B is amino, N-lower-alkylamino, N,N-di-lower-alkylamino, 4-morpholinyl, 4-thiomorpholinyl, 1-piperidinyl, 1-pyrrolidinyl, 1-azetidinyl, 4-lower-alkyl-1-piperazinyl or 1-(hexahydro-4H-1,4-diazepinyl);

(B) acid-addition salts thereof; and (C) the racemic mixtures and the d- and l-enantiomers thereof.

5,066,804

PREPARATION OF ALKYL MORPHOLINONES

Wei-Yang Su, Austin, Tex., assignor to Texaco Chemical Company, White Plains, N.Y.

Filed Oct. 12, 1990, Ser. No. 596,642

Int. Cl.[5] C07D *265/32*

U.S. Cl. 544—173 **6 Claims**

1. A method for the preparation of a 4-alkyl-2-morpholinone which comprises reacting glyoxal with a N-alkyl monoethanolamine at a temperature of about −10° to 20° C. for about 1 to 5 hours in solution in a solvent that will form an azeotrope with water selected from the group consisting of toluene, xylene and ethyl benzene and then heating the reaction mixture to a temperature of at least about 110° C. to remove an azeotrope of water and solvent from the mixture to thereby substantially selectively convert the N-alkylmonoethanolamine to the corresponding 4-alkyl-2-morpholinone, and recovering the 4-alkyl-2-morpholinone,

the alkyl group of said N-alkyl monoethanolamine containing 1 to 18 carbon atoms.

5,066,805

CATALYTIC HYDROGENATION OF 2-AMINO-6-CHLOROPURINE

Peter M. Kincey, Epsom, England, assignor to Beecham Group, p.l.c., Brentford, England

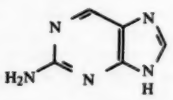
Filed Jul. 18, 1989, Ser. No. 381,584

Claims priority, application United Kingdom, Jul. 20, 1988, 8817270

Int. Cl.[5] C07D *473/32*

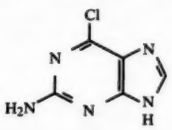
U.S. Cl. 544—277 **4 Claims**

1. A process for the preparation of a compound of formula (I):



(I)

which process comprises the reduction in an aqueous solution in the presence of a base essentially devoid of an organic solvent of a compound of formula (II):



(II)

by catalytic hydrogenation using palladium on charcoal as catalyst.

5,066,806

NOVEL SEPARATION PROCESS

Emmerich Pastorek, Hemsbach; Winfried Orth, Hassloch; Wolfgang Weiss, Neckarhausen, and Hans W. Kleffner, Battenberg, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 566,961

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932136

Int. Cl.[5] C07D *215/18*

U.S. Cl. 546—180 **9 Claims**

1. A process for the recovery of isomeric pure 7-chloroquinaldine from isomeric mixtures of chloro-quinaldines comprising dissolving the isomeric mixture of chloro-quinaldines in an organic solvent, adding an aqueous tartaric acid solution to the organic solution to form the tartrate of 7-chloroquinaldine in crystalline form, recovering the crystals and treating the same with a base to obtain 7-chloro-quinaldine.

5,066,807

PROCESS FOR THE PREPARATION OF CASTANOSPERMINE

Peter B. Anzeveno, Zionsville; Paul T. Angell, and Laura J. Creemer, both of Indianapolis, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Mar. 12, 1990, Ser. No. 492,507

Int. Cl.[5] C07D *471/04, 493/14, 493/04*

U.S. Cl. 546—183 **4 Claims**

1. A process for converting 5-(t-BOC)amino-5-deoxy-l,2 O-isopropylidene-α-D-glucuronolactone to castanospermine which comprises (a) reacting 5-(t-BOC)amino-5-deoxy-l,2-O-isopropylidene-α-D-glucuronolactone (I) with ethyl acetate and a strong base in an inert solvent at low temperature whereby the ethyl acetate adds across the carbonyl group of the lactone to give the corresponding cyclic hemiketal of a β-keto ester (II); (b) hydrogenating the hemiketal catalytically under pressure over a platinum catalyst in ethyl acetate to reduce the β-keto function and give β-hydroxy ester (III); (c)

treating the β-hydroxy ester with formic acid in an inert solvent with cooling to remove the protecting group from the amine followed by basification to provide internal cyclization of the amine to give lactam (IV); (d) reducing the lactam with an aluminum hydride reducing agent to give the corresponding pyrrolidine (V); and (e) treating the pyrrolidine first with trifluoroacetic acid with cooling and then hydrogenating over platinum catalyst under pressure to give castanospermine (VI).

3. A process according to claim 1 wherein the starting 5-(t-BOC)amino-5-deoxy-1,2-O-isopropylidene -α-D-glucuronolactone is obtained from 1,2-O-isopropylidene -5-oxo-60-D-glucuronolactone by reacting that lactone with O-benzylhydroxylamine or O-(trimethylsilyl)hydroxyl amine to give the corresponding 5-oxime followed by catalytic hydrogenation of the oxime, using palladium on carbon, in the presence of t-BOC-anhydride.

5,066,808
PYRIDYL INSECTICIDALLY ACTIVE CYANO COMPOUNDS

Kozo Shiokawa, Kawakasaki; Shinichi Tsuboi, Hino; Koichi Moriya, Tokyo; Ikuro Honda, Tanashi; Yumi Hattori, and Katsuhiko Shibuya, both of Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

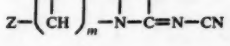
Filed Sep. 14, 1990, Ser. No. 584,398

Claims priority, application Japan, Oct. 21, 1988, 63-264020; Mar. 13, 1989, 1-57813

Int. Cl.[5] A01N *47/42*; C07D *213/40*

U.S. Cl. 514—231.5 **5 Claims**

1. A cyano compound of the formula (I)



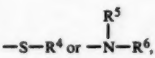
wherein

R^1 is hydrogen, methyl, ethyl or propyl,

m is 1

R^2 is hydrogen, C_{1-6} alkyl,

R^3 is



in which

R^4 is C_{1-6} alkyl R^5 and R^6 are hydrogen, C_{1-9} alkyl and in addition, R^5 and R^6 may form, together with the N-atom to which they are bonded, pyrrolidino, piperidino, 2-methylpiperidino, morpholino, piperazino or isoxazolidino, and Z is a 6 membered heterocyclic group which is substituted by halogen or C_{1-2} alkyl and contains one heteroatom N, as a ring member, provided that where Z is pyridyl substituted by halogen, m is 1, R^2 is methyl, ethyl or propyl and R^3 is —S-alkyl (C_{1-3}) or —S-benzyl, then R^1 is methyl, ethyl or propyl.

5,066,809
PREPARATION OF 3-METHYLPYRIDINE FROM 2-METHYLGLUTARONITRILE

Dev D. Suresh, Hudson, Ohio; Robert DiCosimo, Wilmington, Del.; Richard Loiseau, Bainbridge, Ohio; Maria S. Friedrich, Lyndhurst, Ohio, and Hsiao-Chiung Szabo, Mentor, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 27, 1990, Ser. No. 589,307

Int. Cl.[5] C07D *213/08*

U.S. Cl. 546—250 **7 Claims**

1. A process for making 3-methylpyridine by contacting 2-methylglutaronitrile in admixture with hydrogen gas with a supported solid catalyst containing palladium metal promoted with at least one of Cr, W, Ni, Co and Ge.

5,066,810
3,5-DIMETHYL-4-METHOXYPYRIDINE DERIVATIVES

Karl Baumann, Vienna, Austria, assignor to CL Pharma Aktiengesellschaft, Linz, Austria

Filed Nov. 7, 1989, Ser. No. 432,874

Claims priority, application Austria, Nov. 15, 1988, 2789/88

Int. Cl.[5] C07D *213/68*

U.S. Cl. 546—300 **1 Claim**

1. 3,5-Dimethyl-4-methoxy-2 aminomethylpyridine.

5,066,811
POLYIMIDAZOLES VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

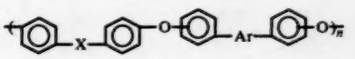
John W. Connell, and Paul M. Hergenrother, both of Yorktown, Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 12, 1990, Ser. No. 508,316

Int. Cl.[5] C07F *9/28*; C07D *211/70, 211/82*

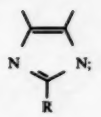
U.S. Cl. 548—119 **8 Claims**

1. A polyimidazole having the general structural formula:

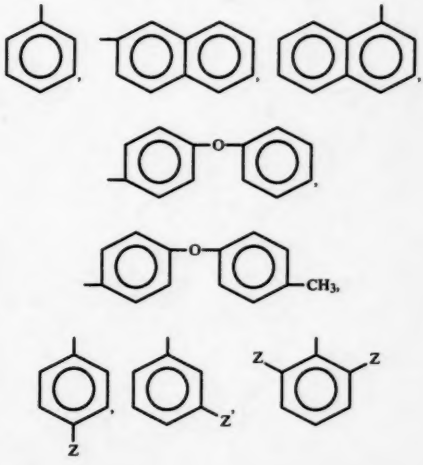


wherein the substitution of oxygen is selected from the group consisting of meta meta, para para, and para meta; wherein Ar is a radical selected from the group consisting of:

(a)



wherein R is selected from the group consisting of: H, CH_3, CF_3, CH_2CH_3, OCH_3,



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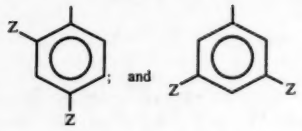
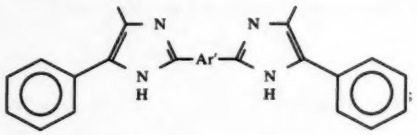
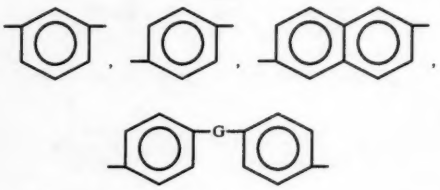


wherein Z is a radical selected from the group consisting of: CF_3, F, Cl, Br, I, CH_3, OCH_3, CH_2CH_3, NO_2, and Ph; and

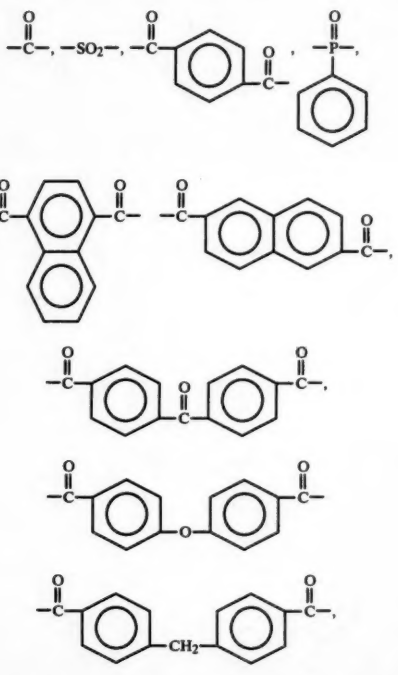
(b)



wherein Ar' is selected from the group consisting of:



wherein G is a bond or is a substituent selected from the group consisting of: CH_2, O, S, C=O, and SO_2; wherein X is a radical selected from the group consisting of:



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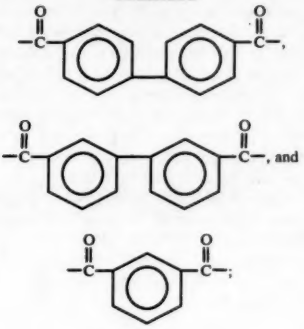


and wherein n is an integer between 4 and 100.

5,066,812

3-PROPENYLCEPHEM DERIVATIVE

Kamiya Takashi; Naito Toshihiko; Negi Shigeto; Komatu Yuuki; Kai Yasunobu; Nakamura Takaharu; Sugiyama Isao; Machida Yoshimasa; Nomoto Seiichiro; Kitoh Kyosuke; Katsu Kanemasa, and Yamauchi Hiroshi, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

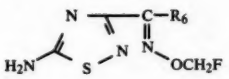
Division of Ser. No. 107,631, Oct. 13, 1987, Pat. No. 4,921,850. This application Jan. 11, 1990, Ser. No. 463,514

Claims priority, application Japan, Oct. 13, 1986, 61-241480; Nov. 6, 1986, 61-262799; Dec. 10, 1986, 61-292574; Feb. 3, 1987, 62-21866; Sep. 3, 1987, 62-219230; Sep. 7, 1987, 62-222147

Int. Cl.[5] C07D *285/08*

U.S. Cl. 548—128 **5 Claims**

1. A compound of the formula:



wherein R_6 represents carboxyl, a halogenocarbonyl, carbamoyl or cyano group, a compound wherein said amino and/or carboxyl group is protected with a protective group, or a salt thereof.

5,066,813

METHOD FOR PRODUCTION OF 1,3-THIAZOLIDIN-2-ONES

Masao Kitano, Kamakura; Mitsuaki Yagisawa, Kawasaki, and Yutaka Morimoto, Yokohama, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 7, 1990, Ser. No. 489,672

Claims priority, application Japan, Mar. 8, 1989, 1-53867

Int. Cl.[5] C07D *277/14*

U.S. Cl. 548—182 **3 Claims**

1. A method for the production of 1,3-thiazolidin-2-one which comprising causing 2,2-dimethyl-1,3-thiazolidine with urea in the absence of water at a temperature of 80° to 200° C.

5,066,814

2-DICARBOXIMIDEFLUORANE OR 3-DICARBOXIMIDEFLUORANE COMPOUNDS

Rudolf Zink, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

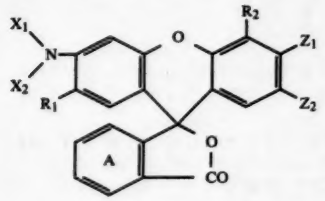
Filed Feb. 23, 1990, Ser. No. 485,355

Claims priority, application Switzerland, Feb. 24, 1989, 675/89

Int. Cl.[5] C07D *493/10*

U.S. Cl. 548—407 13 Claims

1. A 2-dicarboximidefluorane or 3-dicarboximidefluorane compound of the formula



(I)

in which R_1 and R_2 independently of one another are each hydrogen, halogen, lower alkyl or lower alkoxy, one of Z_1 and Z_2 is the dicarboximide group

and the other is hydrogen, halogen, lower alkyl or lower alkoxy, W is a radical of a dicarboxylic acid containing at least 2 carbon atoms, X_1 and X_2 independently of one another are each hydrogen, alkyl which has not more than 12 carbon atoms and is unsubstituted or substituted by halogen, hydroxyl, cyano, tetrahydrofuryl or lower alkoxy, cycloalkyl which has 5 to 10 carbon atoms or benzyl or phenyl each of which is unsubstituted or substituted by halogen, cyano, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonyl, —NX'X" or -4-NX'X"-phenylamino in which X' and X" independently of one another are hydrogen, lower alkyl, cyclohexyl, benzyl or phenyl, or X_1 and X_2, together with the nitrogen atom linking them, are a five-membered or six-membered heterocyclic radical, and in which the ring A is unsubstituted or substituted by halogen, nitro, lower alkyl, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, amino, mono-lower alkylamino or di-lower alkylamino.

5,066,815

PROCESS FOR PREPARING OPTICALLY ACTIVE ALCOHOL

Noboru Sayo; Hidenori Kumobayashi; Susumo Akutagawa, all of Kanagawa; Ryoji Noyori, and Hidemasa Takaya, both of Aichi, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

Continuation of Ser. No. 207,476, Jun. 16, 1988, abandoned. This application May 8, 1990, Ser. No. 520,149

Claims priority, application Japan, Jun. 19, 1987, 62-152483

Int. Cl.[5] C07D *307/33*

U.S. Cl. 549—319 2 Claims

1. A process for preparing an optically active alcohol represented by formula (I):

(I)

wherein A represents a lower alkyl group, phenyl or benzyl and B represents a lower alkoxycarbonyl group, a haloalkyl group, a lower alkoxyalkyl group, a hydroxymethyl group, a halophenyl group, or a lower alkyl-substituted aminomethyl group, provided that A and B cannot be the same simultaneously, which comprises asymmetrically hydrogenating a carbonyl compound represented by formula (II):

(II)

wherein A and B are as defined above, in the presence of a ruthenium-optically active phosphine complex as a catalyst.

5,066,816

PROCESSES FOR PREPARING OPTICALLY ACTIVE 3,4-DIHYDRO-3,4-EPOXY-2H-1-BENZOPYRAN COMPOUNDS AND INTERMEDIATES THEREFOR

Shinro Setoguchi; Mineo Tsuruda, both of Fukuoka; Chiaki Kitami, Mie, and Tsutomu Yamanaka, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

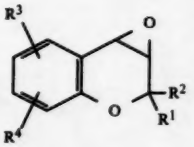
Filed Feb. 28, 1990, Ser. No. 486,100

Claims priority, application Japan, Mar. 3, 1989, 1-52700; May 23, 1989, 1-131014

Int. Cl.[5] C07D *311/78*

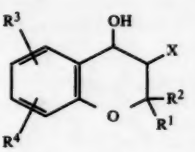
U.S. Cl. 549—331 1 Claim

1. A process for preparing an optically active 3,4-dihydro-3,4-epoxy-2H-1-benzopyran compound of the formula (I):



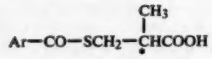
(I)

wherein R^1 and R^2 are the same or different, and each is hydrogen or C_{1-6} alkyl, or R^1 and R^2 combined together form C_{2-5} alkylene, R^3 and R^4 are the same or different, and each is hydrogen, halogen, nitro, cyano, amino, C_{1-6} alkyl, halo-C_{1-6} alkyl, C_{1-6} alkoxy, carboxy, formyl, C_{2-6} alkanoyl, halo-C_{2-6} alkanoyl, benzoyl, naphthoyl, phenyl-C_{2-6} alkanoyl, naphthyl-C_{2-6} alkanoyl, formylamino, C_{2-6} alkanoylamino, benzoylamino, naphthoylamino, phenyl-C_{2-6} alkanoylamino, naphthyl-C_{2-6} alkanoylamino, carbamoyl, C_{1-6} alkylcarbamoyl, di-C_{1-6} alkylcarbamoyl, C_{1-6} alkylsulfinyl, phenylsulfinyl, naphthylsulfinyl, C_{1-6} alkylsulfonyl, phenylsulfonyl, naphthylsulfonyl, sulfamoyl, C_{1-6} alkylsulfamoyl or di-C_{1-6} alkylsulfamoyl, in which the terms "phenyl", "naphthyl", "benzoyl", and "naphthoyl" include substituted phenyl, substituted naphthyl, substituted benzoyl and substituted naphthoyl the substituents being at least one substituent selected from the group consisting of halogen, hydroxy, amino, nitro, cyano, C_{1-6} alkyl, C_{1-6} alkoxy and trifluoromethyl on the ring, which comprises (i) reacting a compound of the formula (III):



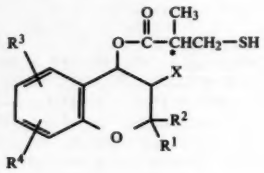
(III)

wherein X is bromine, chlorine or iodine and other symbols are as defined above, with a compound of the formula (IV):



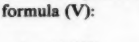
(IV)

wherein Ar is phenyl, naphthyl, thienyl, furyl, pyridyl, or substituted phenyl, naphthyl, thienyl, furyl, pyridyl said groups being substituted by 1 to 3 substituents selected from the group consisting of halogen, amino, nitro, hydroxy, C_{1-6} alkyl and C_{1-6} alkoxy and the asterisked carbon atom has (S)-(−)- or (R)-(+)- configuration, or the corresponding reactive derivative on the carboxyl group, or (ii) reacting a compound of the formula (II-a):



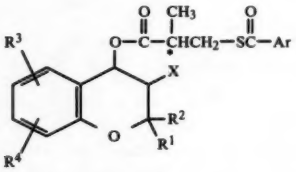
(II-a)

wherein each symbol is as defined above, with a compound of the formula (V):



(V)

wherein Ar is as defined above, or the corresponding reactive derivative on the carboxyl group, subjecting the thus obtained compound from step (i) or (ii) of the formula (II-b):



(II-b)

wherein each symbol is as defined above, to fractional crystallization followed by hydrolysis and cyclization.

5,066,817

DC115A COMPOUNDS PRODUCED BY STREPTOMYCES SP.

Hirofumi Nakano; Mitsunobu Hara, both of Machida; Tsuyoshi Mokudai, Hofu; Isao Kawamoto, Hiratsuka; Mayumi Yoshida, Sagamihara, and Eiji Kobayashi, Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

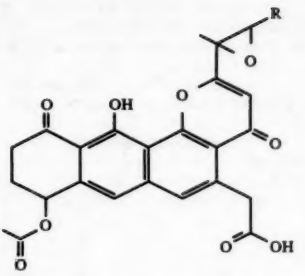
Filed Apr. 30, 1990, Ser. No. 516,304

Claims priority, application Japan, May 8, 1989, 1-114783; Nov. 6, 1989, 1-288553

Int. Cl.[5] C07D *311/78, 311/94*

U.S. Cl. 549—384 **5 Claims**

1. DC115A compounds represented by the following general formula:



wherein R represents ethyl, propyl or 1-propenyl.

5,066,818

PHOTOCHROMIC NAPHTHOPYRAN COMPOUNDS

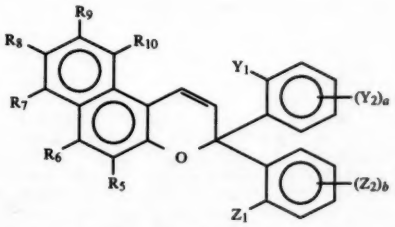
Barry V. Gemert, Murrsyville, Pa., and Maria P. Bergomi, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1990, Ser. No. 490,031

Int. Cl.[5] C07D *311/92*

U.S. Cl. 549—389 **35 Claims**

1. A naphthopyran compound represented by the following graphic formula:



wherein Y_1 is selected from the group consisting of C_1–C_5 alkyl, C_1–C_5 alkoxy, fluoro and chloro; Z_1 is selected from the group consisting of hydrogen and Y_1; Y_2 and Z_2 are each selected from the group consisting of C_1–C_5 alkyl, C_1–C_5 alkoxy, cyano, hydroxy, halogen, acrylyl, methacrylyl, acryloxy (C_1–C_4) alkyl and methacryloxy (C_1–C_4) alkyl; a and b are each integers selected from the group consisting of 0, 1 and 2; and R_5–R_{10} are each selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_5–C_7 cycloalkyl, phenyl, mono- or di- substituted phenyl, C_1–C_4 alkoxy, halogen, acrylyl, methacrylyl, acryloxy (C_1–C_4) alkyl, methacryloxy (C_1–C_4) alkyl, furyl and thienyl, said phenyl substituents being selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro and bromo.

5,066,819

PROCESS FOR THE PREPARATION OF ARYL ESTERS OF N-ALKYL CARBAMIC ACIDS

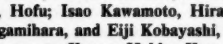
Gurunath H. Kulkarni; Rajan H. Naik, and Srinivasachari Rajappa, all of Maharashtra, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Mar. 20, 1990, Ser. No. 496,427

Int. Cl.[5] C07D *317/26, 317/64, 271/44*

U.S. Cl. 549—438 **8 Claims**

1. A process for the preparation of aryl esters of N-alkyl carbamic acids, said esters having the general formula:



wherein R_1 is an alkyl group and R_2 is an aryl group which

comprises reacting an alkyl N-alkyl carbamate of the general formula:

$$R_1—NH—COO—R_3$$

wherein R_1 and R_3 are both alkyl groups, with a substituted phenol in the presence of a halogen-containing of phosphorous compound selected from the group consisting of phosphoryl chloride, phosphorous tribromide and phosphorus pentachloride, the R_2 aryl group being derived from the substituted phenol reactant.

5,066,820

PROCESS FOR THE PREPARATION OF 1-AMINO-2-CARBOXYANTHRAQUINONES

Reinhard Helwig, Gruenstadt, and Helmut Hoch, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

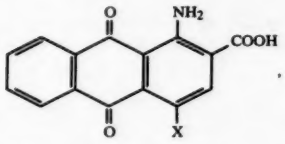
Filed Jul. 12, 1990, Ser. No. 551,953

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925060

Int. Cl.[5] C07C *50/24, 97/24;* C09B *1/16*

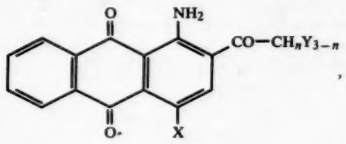
U.S. Cl. 522—249 **6 Claims**

1. A process for the preparation of a 1-amino-2-carboxyanthraquinone of the general formula I



(I)

in which X denotes hydrogen, chlorine or bromine, by oxidation, under alkaline conditions, of a 1-aminoanthraquinone substituted in the 2-position by an oxidizable carbo-organic radical followed by acidification of the reaction mixture, wherein a 1-amino-2-haloacetylanthraquinone of the general formula II



(II)

in which Y denotes chlorine or bromine and n is equal to 0, 1 or 2, is reacted with a peroxide compound or oxygen as oxidizing agent.

5,066,821

PROCESS FOR PREPARING POSITIVE ELECTROSTATIC LIQUID DEVELOPERS WITH ACIDIFIED CHARGE DIRECTORS

William A. Houle, Kimberton; James R. Larson, West Chester, both of Pa., and Kathryn A. Pearlstine, Wilmington, Del., assignors to DXImaging, Lionville, Pa.

Filed May 11, 1990, Ser. No. 522,283

Int. Cl.[5] G03G *9/06*

U.S. Cl. 430—137 **30 Claims**

1. A process for preparing a positive electrostatic liquid developer comprising

(A) dispersing at an elevated temperature in a vessel a thermoplastic resin and a nonpolar liquid having a Kauributanol value of less than 30, while maintaining the temperature in the vessel at a temperature sufficient to plasticize and liquify the resin and below that at which the nonpolar liquid degrades and the resin decomposes,

(B) cooling the dispersion, either

(1) without stirring to form a gel or solid mass, followed by shredding the gel or solid mass and grinding by means of particulate media;

(2) with stirring to form a viscous mixture and grinding by means of particulate media; or

(3) while grinding by means of particulate media to prevent the formation of a gel or solid mass;

(C) separating the dispersion of toner particles having an average particle size of less than 30 μm from the particulate media, and

(D) adding to the dispersion subsequent to Step (A) a nonpolar liquid soluble ionic or zwitterionic charge director compound mixed with an acid having a pKa of <4.2 and a solubility of at least 0.5% based on the weight of charge director compound in the mixture of nonpolar liquid and charge director compound.

5,066,822

DI-T-BUTYLPHENOLS SUBSTITUTED BY AN ALKOXY OR BENZYLOXY GROUP OR A BENZYLTHIO GROUP

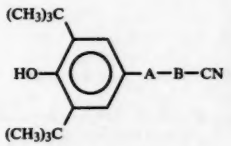
Mark A. Rustad, Afton, Minn., assignor to Riker Laboratories, Inc, St. Paul, Minn.

Division of Ser. No. 248,586, Sep. 26, 1988, Pat. No. 4,968,710, which is a continuation-in-part of Ser. No. 120,468, Nov. 13, 1987, abandoned. This application Jun. 29, 1990, Ser. No. 571,925

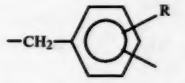
Int. Cl.[5] C07C *255/32, 255/37, 255/50*

U.S. Cl. 558—389 **1 Claim**

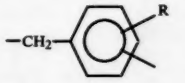
1. A compound of the formula



wherein A is an oxygen or sulfur atom; and B is a straight chain alkylene group of 3 to 8 carbon atoms or



wherein the methylene group is bonded to A, and R is hydrogen, halogen, lower alkyl or lower alkoxy; with the proviso that when A is sulfur, B is



wherein the methylene group is bonded to A.

5,066,823

PREPARATION OF 5-ACYLAMINO-2,4,6-TRIIODO- OR TRIBROMO-BENZOIC ACID DERIVATIVES

Ernest Felder; Carlo Musu; Luciano Fumagalli, and Fulvio Uggeri, all of Milan, Italy, assignors to Bracco Industria Chemica S.P.A., Milan, Italy

PCT No. PCT/EP88/00453, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO88/09328, PCT Pub. Date Dec. 1, 1988

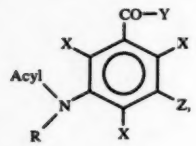
PCT Filed May 20, 1988, Ser. No. 424,216

Claims priority, application Italy, May 22, 1987, 20647 A/87; May 10, 1988, 47935 A/88

Int. Cl.[5] C07C *315/04*

U.S. Cl. 560—13 12 Claims

1. A process for the preparation of 5-acylamino-2,4,6-triiodo or tribromo-benzoic acid derivatives of formula I



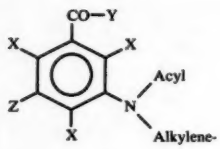
I

wherein:

X is I or Br, with the proviso that they are all the same;

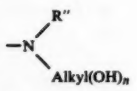
Acyl is a C_2–C_6 hydroxyalkanoyl, alkoxyalkanoyl or alkoxy-hydroxyalkanoyl group or a C_2–C_4 unsubstituted alkanoyl group,

R is H or a C_1–C_6 alkyl, hydroxyalkyl, alkoxyalkyl or alkoxy-hydroxyalkyl group, or a $H(OCH_2CH_2)_{2-5}$—, $Me(OCH_2CH_2)_{2-4}$— or $Et(OCH_2CH_2)_{2-4}$— group, or a group of formula



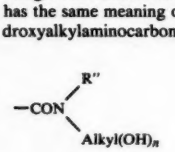
wherein X, Y, Z and Acyl have respectively the same meanings as in formula I and Alkylene- is a straight or branched C_2–C_8 alkylene group, which is unsubstituted or substituted by hydroxy groups and/or interrupted by O,S, SO or SO_2,

Y is a hydroxy, alkoxy, hydroxyalkoxy, alkylamino group or a hydroxyalkylamino group of formula



wherein R'' is H or a C_1–C_5 alkyl, hydroxyalkyl, alkoxyalkyl or alkoxy-hydroxyalkyl group, Alkyl is a C_2–C_5 straight or branched alkyl group and n = 1, 2 or 3,

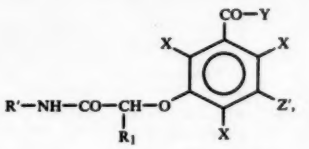
Z has the same meaning of CO—Y in formula I or is a hydroxyalkylaminocarbonyl group of formula



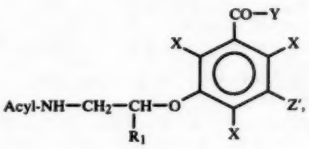
wherein R'', Alkyl and n are as above defined or Z is a C_2–C_5 acylamino, hydroxyacylamino, N-alkyl-acylamino, N-hydroxyalkylacylamino or acylaminomethyl group,

with the proviso that at least one of the two Acyl or R groups is hydroxy substituted,

said process being characterized in that 5-(alkylaminocarbonyl-alkoxy)-2,4,6-triiodo or tribromo-benzoic acid derivatives of formula II, or 5-(acylamino-alkoxy)-2,4,6-triiodo or tribromo-benzoic acid derivatives of formula III



II

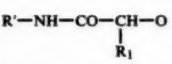


III

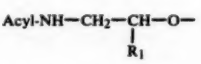
wherein:

X and Y have the same meanings as in formula I,

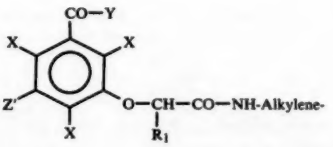
Z' is a) the same as Z in formula I, b) a group of formula



or c)



wherein R', R_1 and Acyl are as hereinbelow defined, R' is a), H; b) a C_1–C_6 alkyl, hydroxyalkyl, alkoxyalkyl or alkoxy-hydroxyalkyl group; c) a $H(OCH_2CH_2)_{2-5}$—, $Me(OCH_2CH_2)_{2-4}$— or $et(OCH_2CH_2)_{2-4}$— group, or d) a group of formula



wherein X, Y, Z' are as above defined, R_1 is as hereinbelow defined, Alkylene- is a straight or branched C_2–C_8 alkylene group, which is unsubstituted or substituted by hydroxy groups and/or interrupted by O, S, SO or SO_2,

R_1 is H or a C_1–C_3 alkyl, hydroxyalkyl or alkoxyalkyl group,

Acyl is a a) C_2–C_6 hydroxyalkanoyl, b) alkoxyalkanoyl c) alkoxy-hydroxyalkanoyl group or an unsubstituted C_2–C_4 alkanoyl group, are subjected, to a rearrangement reaction to give the desired compounds of formula I in the presence of a base in an aqueous medium, said base being sodium hydroxide, lithium hydroxide, potassium hydroxide, an alkali metal carbonate or alkali metal bicarbonate, an alkali metal borate, a tertiary amine or a quaternary ammonium hydroxide.

5,066,824

NOVEL PROCESS FOR THE PREPARATION OF AMINE-TERMINATED COMPOUNDS

Robson Mafoti, and Josef Sanders, both of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 524,268, May 15, 1990, abandoned. This application Aug. 3, 1990, Ser. No. 562,293
Int. Cl.[5] C07C *209/00*
U.S. Cl. 560—44 8 Claims

1. A process for the preparation of an amine-terminated compound comprising reacting a polyfunctional acetoacetic acid ester with either ammonia or an organic compound which contains one or more primary amino groups in the presence of a solvent and an acidic catalyst selected from the group consisting of (i) boron trifluoride etherate and (ii) organic acids having pKa values of from 0.1 to 0.8, with the proviso that if the primary amino group containing compound contains no aromatically bound amino groups, the pKa of said organic acid is from 0.1 to less than 0.7.

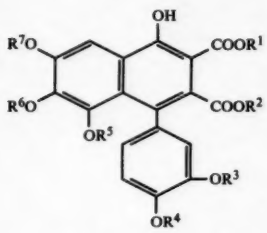
5,066,825

PROCESS FOR PREPARING A NAPHTHALENE DERIVATIVE

Takashi Suzuki, Kawanishi; Minehiko Yamamura, Itami, and Shinichi Yamada, Ashiya, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Nov. 16, 1989, Ser. No. 437,065
Claims priority, application Japan, Nov. 29, 1988, 303335
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—56 10 Claims

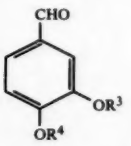
1. In a process for preparing a naphthalene derivative of the formula:



(I)

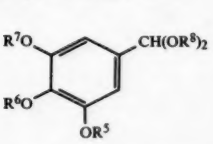
wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are a lower alkyl group, or a pharmaceutically acceptable salt thereof, which comprises the steps of:

A) reacting a compound of the formula:



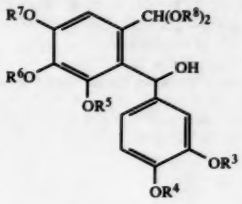
(II)

wherein R^3 and R^4 are the same as defined above, with a compound of the formula:



(III)

wherein R^5, R^6 and R^7 are the same as defined above and R^8 is a lower alkyl group, to give a compound of the formula;



(IV)

wherein R^3, R^4, R^5, R^6, R^7 and R^8 are the same as defined above,

B) reacting the compound (IV) or a salt thereof with a compound of the formula:

$$R^1OOC—C{\equiv}C—COOR^2 \quad (V)$$

wherein R^1 and R^2 are the same as defined above, and

C) if required, further converting the product into a pharmaceutically acceptable salt thereof; the improvement comprising using a non-brominated compound for compound (III).

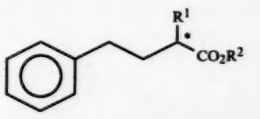
5,066,826

PROCESS FOR RACEMIZATION OF OPTICALLY ACTIVE 4-PHENYLBUTANOIC ACID ESTERS

Hiroyuki Nohira, Urawa; Takashi Onishi; Kazuo Yamamoto, both of Kurashiki, and Noriaki Kumagai, Kamisu, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Sep. 26, 1990, Ser. No. 588,545
Claims priority, application Japan, Oct. 6, 1989, 1-262516
Int. Cl.[5] C07C *69/76*
U.S. Cl. 560—60 6 Claims

1. A process for the racemization of optically active 4-phenylbutanoic acid esters which comprises treating optically active 4-phenylbutanoic acid esters of the general formula (I)



(I)

wherein R^1 represents a hydroxy group, a hydroxy group protected by vinyl ether, or a lower acyloxy group and R^2 represents a lower alkyl group with a base selected from the group consisting of alkali metal alcoholates, alkali metal hydrides, and alkali metal amides.

5,066,827

PREPARATION OF METHYLENEDI(PHENYLURETHANE)

Michel Gubelmann; Christophew Rochin, both of Lyons, and Christian Allandrieu, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 29, 1990, Ser. No. 545,502
Claims priority, application France, Jun. 29, 1989, 89 09001
Int. Cl.[5] C07C *269/06*
U.S. Cl. 560—163 11 Claims

1. In a process for the preparation of methylenedi(phenylurethane) by condensing an alkyl N-phenylcarbamate with a methylenating agent in the presence of a catalytically effective amount of a protonic acid, the improvement which comprises utilizing as the protonic acid catalyst therefor, hydrofluoric acid.

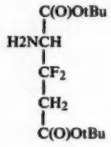
5,066,828

DIFLUOROGLUTAMIC ACID CONJUGATES WITH FOLATES AND ANTI-FOLATES FOR THE TREATMENT OF NEOPLASTIC DISEASES

Philippe Bey, and H. Michael Kolb, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Apr. 12, 1990, Ser. No. 508,874
Int. Cl.[5] C07C *229/24*
U.S. Cl. 560—171 3 Claims

1. A compound of the formula



or a basic or an acid addition salt thereof.

5,066,829

PREPARATION OF CARBOXYLIC ACID ESTERS

Herbert E. Fried, and Thomas H. Johnson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 17, 1990, Ser. No. 510,309
Int. Cl.[5] C07C *67/02*
U.S. Cl. 560—217 7 Claims

1. A process for the preparation of higher alkyl acrylic acid esters which comprises contacting and reacting under a temperature in the range of from about 40° C. to about 220° C. and a pressure in the range of from about 0 psig and about 1000 psig at least one olefin with at least one alkyl acrylic acid ester in the presence of a catalytically effective amount of tantalum pentachloride.

5,066,830

PEPPER GAMETOCLONAL VARIATION

Robert A. Morrison, and David A. Evans, both of Palmyra, N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Jan. 12, 1988, Ser. No. 142,961
Int. Cl.[5] A01H *1/04*
U.S. Cl. 800—230 17 Claims

1. A plant of the pepper species capsicum annuum which regularly produces low-seed fruit having 0 to about 20 seeds, which plant possesses neither a male sterile nor female sterile trait and which low seed trait is not a result of environmental or chemical induction.

5,066,831

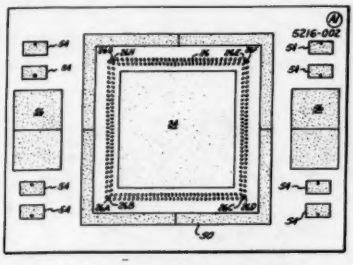
UNIVERSAL SEMICONDUCTOR CHIP PACKAGE

Richard K. Spielberger, Maple Grove, and Thomas J. Dunaway, St. Louis Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 112,851, Oct. 23, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 421,364

Int. Cl.[5] H01L *23/02*

U.S. Cl. 174—52.4 14 Claims



1. A semiconductor chip package, comprising:

a plurality of programmable pads located on a surface of a semiconductor chip package, each pad being adapted for interconnection with a semiconductor chip;

a plurality of signal connectors located on a surface of the package;

a plurality of signal connections, each signal connection providing an electrically conductive path between an individual programmable pad and a corresponding individual signal connector;

a plurality of dedicated power or ground connectors located on a surface of the package; and

connection means comprising electrically conductive paths within the package for selectively connecting any programmable pad to a dedicated power or ground connector, any programmable pad so connected also remaining connected to a corresponding signal connector.

5,066,832

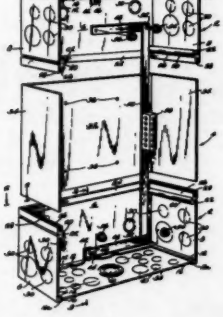
PLASTIC ENCLOSURE BOX FOR ELECTRICAL APPARATUS

Robert J. Clarey, Brookfield, and Richard A. Reiner, Colgate, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 26, 1989, Ser. No. 426,839

Int. Cl.[5] H05K *5/00*

U.S. Cl. 174—50 20 Claims



1. A plastic enclosure box adapted to receive an electrical distribution panelboard therein comprising:

first and second end sections each comprising a rear wall, side walls extending forwardly from opposite sides of said rear wall, and an end wall continuous with said side walls and said rear wall extending forwardly from said rear wall;

an intermediate section of uniform cross-section comprising a rear wall and opposed side walls;

said end sections disposed at opposite ends of said intermediate section wherein said rear wall and side walls of said intermediate section are contiguous with respective rear walls and side walls of said end sections thereby defining a box having an open front side;

openings in said end walls; and

rigid flat filler plates slidably attached to said end walls fully losing said openings, said filler plates having deflectable tab cable retainers or knockouts for attaching electrical conductor means directly to said filler plates.

5,066,833

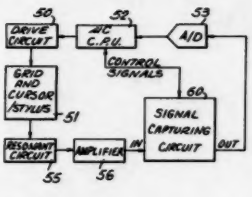
LOW POWER SENSING APPARATUS FOR DIGITIZER TABLETS

Thomas C. Zalenski, Killingworth, Conn., assignor to Summagraphics Corporation, Seymour, Conn.

Filed Nov. 13, 1990, Ser. No. 612,530

Int. Cl.[5] G08C *21/00*

U.S. Cl. 178—19 19 Claims



1. A digitizer tablet comprising:

(a) an electrode array comprising conductors extending along one coordinate axis,

(b) means for producing and applying current pulses to selected ones of the conductors to generate fields,

(c) a pointing device comprising means for interacting with the fields to generate an induced signal,

(d) means connected to the pointing device means for generating from the induced signal an AC signal having positive and negative peaks,

(e) means for measuring and storing a value representative of the AC signal peaks generated when each of the selected conductors is pulsed,

(f) means for processing the values stored by the means of element (e) for determining the position of the pointing device relative to the selected conductors.

5,066,834

FLEXIBLE GUIDE RAIL AND METHOD FOR MANUFACTURING SAME

Hans Richter, Ortierstrasse 77, D-8900 Augsburg, Fed. Rep. of Germany

PCT No. PCT/EP89/00647, § 371 Date Feb. 12, 1990, § 102(e) Date Feb. 12, 1990, PCT Pub. No. WO89/12595, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 9, 1989, Ser. No. 478,515

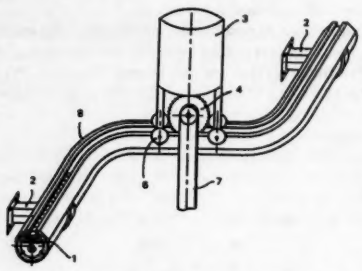
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1988, 3820055

Int. Cl.[5] H02G *1/02*

U.S. Cl. 191—40 8 Claims

1. A method for manufacturing multi-dimensionally curved guide rails having tubular cross-sections for passenger and material transportation vehicle systems characterized by the following steps: bending a hose-like plastic tube of any tubular

cross-section, filling said bent tube with a filling compound to stabilize the shape of said tube, said bent and filled tube being



provided as a guide rail for enabling guidance of a driven vehicle thereon.

5,066,835

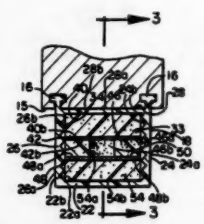
SENSING EDGE

Norman K. Miller, and Bearge D. Miller, both of Concordville, Pa., assignors to Miller Edge, Inc., Concordville, Pa.

Filed Sep. 19, 1990, Ser. No. 585,332

Int. Cl.[5] H01H *3/16*

U.S. Cl. 200—61.43 **9 Claims**



1. A sensing edge for causing a closing door to open by actuation of a device upon force being applied to the sensing edge, the sensing edge comprising:

a sheath compressible upon the application of external pressure anywhere along its surface and fabricated of a flexible material for attachment to a door edge, the sheath including a top wall and a non-linear wall each wall having an exterior surface and an interior surface, the interior surfaces of said top and non-linear walls at least partially defining an area for receiving at least a portion of a switch means, one of the surfaces of the non-linear wall including a groove therein extending toward the other of the surfaces of the non-linear wall to provide an area of reduced wall thickness to thereby enhance the compressibility of the sheath; and

at least a portion of a switch means positioned within the area for actuation of the device upon application of external pressure to the sheath, whereby the groove increases the sensitivity of the sensing edge.

5,066,836

GAS DAMPED DECELERATION SWITCH

Kevin J. Gunning, Tokyo, Japan, and David F. Gallup, San Dimas, Calif., assignors to TRW Technar Inc., Irwindale, Calif.

Continuation of Ser. No. 491,450, Mar. 9, 1990, abandoned. This application Mar. 5, 1991, Ser. No. 664,497

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 R **24 Claims**

2. A gas damped sensor mechanism comprising:

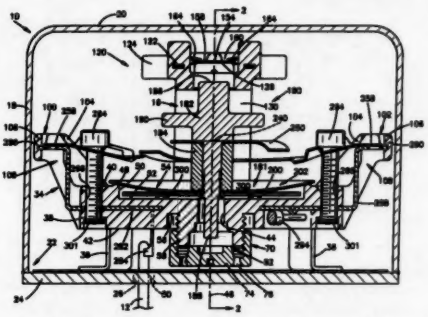
a base having a surface and a passage communicating with said surface;

a mass;

means for supporting said mass for movement relative to said base;

means for sensing a predetermined amount of movement of said mass relative to said base;

a movable damping member connected to said mass for movement with said mass relative to said base, said damping member having an initial position wherein said damping member and said surface define a chamber having an



initial volume, said movement of said damping member increasing the volume of said chamber and causing a pressure reduction in said chamber, said pressure reduction restraining movement of said damping member and said mass relative to said base and causing a flow of gas into said chamber through said passage; and

means for controlling said pressure reduction and said movement of said mass by adjusting at least one of said passage and the initial volume of said chamber.

5,066,837

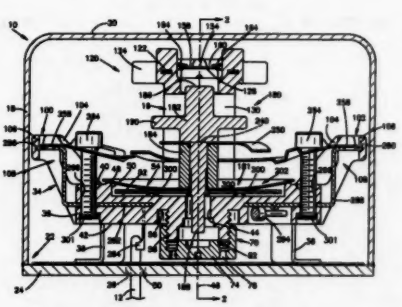
GAS DAMPED DECELERATION SWITCH

Kevin J. Gunning, Tokyo, Japan; David F. Gallup, San Dimas, and Lon E. Bell, Pasadena, both of Calif., assignors to TRW Technar Inc., Irwindale, Calif.

Continuation of Ser. No. 491,110, Mar. 9, 1990, abandoned. This application Mar. 5, 1991, Ser. No. 664,499

Int. Cl.[5] H01H *35/14*

U.S. Cl. 200—61.45 R **52 Claims**



1. A gas damped deceleration sensor comprising:

a movable mass;

means for supporting said mass for movement in response to deceleration;

means for sensing a predetermined amount of said movement of said mass to indicate a predetermined amount of deceleration over a time interval;

a structure having a first surface;

a flexible damping disk assembly having a second surface, said damping disk assembly having a position wherein said

second surface is engaged with a portion of said first surface to define a space between said structure and said damping disk assembly;

said damping disk assembly being connected to said mass to flex relative to said base from said position to enlarge said space and to cause a pressure reduction in said space in response to said movement of said mass, said pressure reduction restraining movement of said mass; and

said damping disk assembly comprising a flexible sealing disk having said second surface, and a flexible spring disk which biases said flexible sealing disk toward said first surface when said damping disk assembly is in said position.

5,066,838

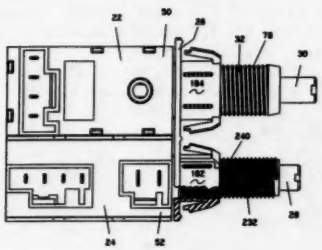
AUTOMOBILE BRAKE SWITCH ASSEMBLY

John W. Smith, and Benjamin F. Chestnut, both of Indianapolis, Ind., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jan. 31, 1990, Ser. No. 472,723

Int. Cl.[5] H01H *3/14*

U.S. Cl. 200—61.89 **7 Claims**



1. An automobile brake switch assembly comprising:

a mounting clip;

first brake switch means carried by said mounting clip comprising: a first switch housing having a hollow first plunger housing; one or more electrical switches enclosed in said switch housing; a first plunger slidable within said first plunger housing; the exterior of said plunger housing having first thread means for connecting said first switch housing to said mounting clip;

second brake switch means carried by said mounting clip comprising: a second switch housing having a hollow second plunger housing; one or more electrical switches enclosed in said second switch housing; a second plunger slidable within said second plunger housing; the exterior of said second plunger housing having second thread means for connecting said second switch housing to said mounting clip; and

said mounting clip comprising:

first ratchet means for engaging said first thread means on said first plunger housing sufficiently firmly to prevent movement of said first plunger housing with respect to said mounting clip while said first plunger is moving in said first plunger housing and sufficiently loosely to allow ratcheting movement of said first plunger housing with respect to said mounting clip when brake mechanism pressure is exerted on said first plunger housing during mounting of said mounting clip to an automobile, and without exerting force on said first plunger housing, in a direction perpendicular to the direction of movement of said first plunger, sufficient to deflect the walls of said first plunger housing;

second ratchet means for engaging said second thread means on said second plunger housing sufficiently firmly to prevent movement of said second plunger housing with respect to said mounting clip while said second plunger is moving in said second plunger housing and sufficiently loosely to allow ratcheting movement of said second plunger housing with respect to said mounting clip when brake mechanism pressure is exerted on said second plunger housing during mounting of said mounting clip to an automobile, and without exerting force on said second plunger housing, in a direction perpendicular to the direction of movement of said second plunger, sufficient to deflect the walls of said second plunger housing; and

said mounting clip including means for fastening said mounting clip to an automobile so the the automobile brake mechanism engages said first and second plungers.

5,066,839

HIGH OR MEDIUM TENSION CIRCUIT BREAKER

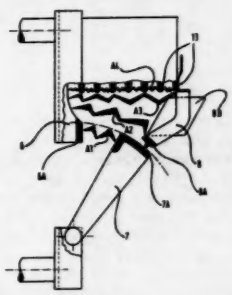
Jean Maineult, Ceyzeriat, and Raymond Pluveau, Macon, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Jan. 9, 1990, Ser. No. 462,362

Claims priority, application France, Jan. 10, 1989, 89 00215

Int. Cl.[5] H01H *33/10, 33/74*

U.S. Cl. 200—144 R **9 Claims**



1. A medium or high tension circuit breaker comprising a shell filled with a dielectric gas under pressure and containing: a fixed main contact, a moving main contact, a fixed arcing contact, and a moving arcing contact, an interrupting chamber disposed adjacent to said fixed arcing contact and an arc being established during contact separation between said moving arcing contact and said fixed arcing contact, said arc interrupting chamber including a plurality of laterally spaced partitions forming a plurality of separate compartments for said interrupting chamber, means for splitting up the arc into a large number of elementary arcs comprising a plurality of spaced metal plates disposed parallel to each other in a plurality of compartments such that for each compartment, two partitions are parallel to each other and perpendicular to said plates positioned therein, said compartments being closed except over an arcing zone, and each partition being equipped with a metal electrode having a portion fitted astride each partition and having two unitary wings extending in respective ones of said adjacent compartments, said wings being planar and extending perpendicular to the plane of the plates in respective compartments, and said wings being at an angle of about 90° to each other.

5,066,840

MANUAL OPERATOR FOR AN ELECTRICAL SWITCH

Dominik M. Wiktor, Cranford, and Siegfried Schlindwein, Succasunna, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Oct. 9, 1990, Ser. No. 597,197

Int. Cl.[5] H01H *3/10*

U.S. Cl. 200—330 **14 Claims**

1. A manual operator for opening and closing an electrical switch having a mechanism including a portion adapted to be rotated to operate the switch, comprising:

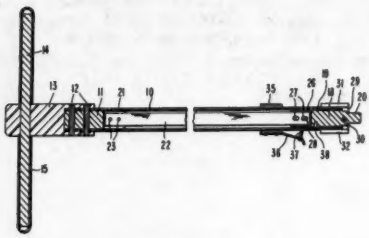
a switch-driving element adapted to non-rotatably engage the rotatable portion of the switch mechanism,

a handle element rotatable with respect to the switch-driving element,

resilient means operatively interposed between the switch-driving element and the handle element, the resilient means being tensioned when the handle element is rotated while the driving element is maintained stationary,

an abutment fixed to and moveable with one of the elements, and

a follower fixed to and moveable with the other of the elements, the follower being located in the path of movement of the abutment, and the follower and abutment being so relatively located that the abutment engages the follower



only after the resilient means has been tensioned by rotation of the handle element,

so that when the switch-driving element engages the rotatable portion of the switch mechanism, initial rotation of the handle element causes the resilient means to be tensioned and the abutment to engage the follower, further rotation of the handle element being transmitted through the abutment and follower to the switch-driving element to initiate movement of the switch mechanism, following which the resilient means instantly shifts the switch mechanism through the remainder of its movement to snap the switch open or closed.

5,066,841

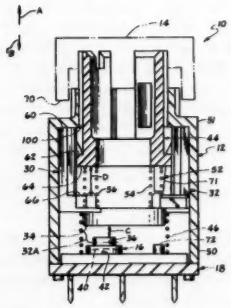
DUAL PLUNGER SWITCH

Jon P. Zoller, Prior Lake, and Jeffrey J. Norris, Bloomington, both of Minn., assignors to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 378,726, Jul. 12, 1989, abandoned. This application Jul. 31, 1990, Ser. No. 560,919

Int. Cl.[5] H01H *3/48*

U.S. Cl. 200—342 **6 Claims**



1. A switch assembly of the type that is operable by pressing a button or the like inwardly, and wherein release of the button or the like allows it to move outwardly to an unoperated position, comprising:

a housing having inner and outer end portions, said outer end portion lying outwardly of said inner end portion;

a plunger assembly slideably mounted to move in opposite inner and outer directions in said housing and including inner and outer plungers and an outer spring resiliently biasing the outer plunger outwardly with respect to the inner plunger, each of said plungers being separately moveable in opposite inner and outer directions and said inner plunger being moveable along a predetermined path;

an inner spring biasing said inner plunger outwardly with respect to said housing;

a short travel switch lying in said housing inward of said inner plunger and having a deflectable part lying along the path of said inner plunger, said switch being operable by depression of said deflectable part;

said outer plunger having a shoulder that abuts said inner plunger at a position that preloads said outer spring;

the preloads and spring rates of said inner and outer springs being chosen so that said outer spring is partially compressed from the position at which said shoulder abuts said inner plunger, when said inner plunger first contact said deflectable part of said short travel switch.

5,066,842

KEY TOP

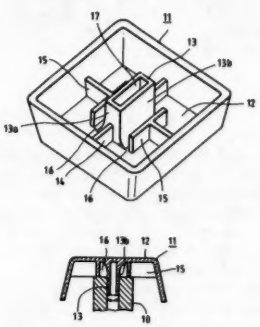
Kazuyoshi Yamagata, Sumiyoshi; Masaaki Kageyama, and Kyoichi Kaneko, both of Iwaki, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,467

Claims priority, application Japan, Oct. 27, 1989, 1-278628

Int. Cl.[5] H01H *3/12*

U.S. Cl. 200—345 **4 Claims**



1. A key top comprising:

a top plate having top and bottom surfaces;

an engaging protrusion extending from said bottom surface of said top plate and disposed at the approximately central portion of said bottom surface of said top plate, said engaging protrusion terminating in a free end; and

a plurality of reinforcing ribs extending from said bottom surface of said top plate and disposed adjacent to said engaging protrusion, characterized in that at least two gaps are disposed between said engaging protrusion and at least two of said ribs.

5,066,843

HEAT RESISTANT AND LIGHT WEIGHT CONTAINER FOR MATERIALS TO BE ASHED, AND PROCESS FOR MANUFACTURE THEREOF

Robert N. Revesz, Monroe, N.C., assignor to CEM Corporation, Matthews, N.C.

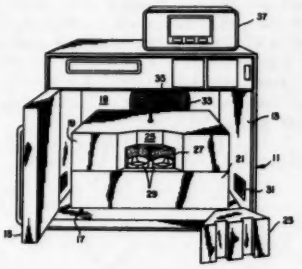
Filed Jan. 18, 1989, Ser. No. 298,553

Int. Cl.[5] H05B *6/80;* **G01N** *31/12*

U.S. Cl. 219—10.55 R **15 Claims**

1. A container for an ashable material which is to be ashed by heat in an ashing furnace, which container is heat resistant during ashing operations in which it is heated to a temperature

up t o 500° C., light in weight, porous and includes integral bottom and side wall portions made of quartz microfibers



which are held together in walled and bottomed container form.

5,066,844

SOLDERING DEVICE WITH STIRRUP ELECTRODES AND A SUCTION PIPETTE

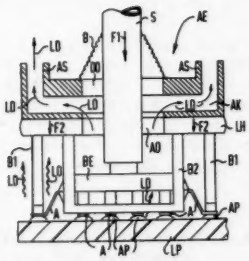
Rudolf Schuster, Heimstetten, and Josef Raschke, Gelting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 25, 1990, Ser. No. 587,793

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932651

Int. Cl.[5] H05B *1/00;* **B23K** *3/00;* **B08B** *15/04*

U.S. Cl. 219—85.16 **1 Claim**



1. A soldering device for soldering components onto printed circuitboards, comprising:

a soldering stirrup holder;

at least two soldering stirrups mounted spaced apart on said stirrup holder for electrical resistance heating;

said stirrup holder comprising aperture means defining a central aperture therethrough between said soldering stirrups;

a suction pipette extending through said central aperture for picking up, conveying and placing a component onto an assigned soldering location on a printed circuitboard; and

vapor extraction means mounted adjacent said stirrup holder for extracting soldering vapors, and including extraction opening means defining an extraction opening communicating with said central aperture to support vapor flow away from said soldering stirrups, said vapor extraction means comprising a first plate mounted on said stirrup holder and including said extraction opening therethrough aligned with said central aperture, a second plate spaced from said first plate and defining an extraction chamber therebetween, port means defining at least one port at the peripheries of said first and second plates in communication with said extraction chamber, means defining a pipette opening through said second plate for receiving said pipette therethrough, and a flexible bellows sealing said second plate to said pipette on the side thereof opposite said extraction chamber.

5,066,845

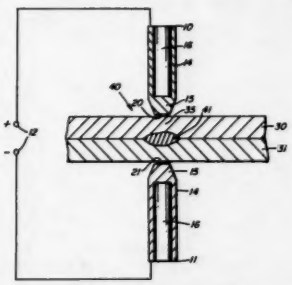
RESISTANCE WELDING ELECTRODE COATED WITH CERAMIC LAYER

Stephen L. Anderson, Traverse City, Mich., assignor to Alcotec Wire Company, Traverse City, Mich.

Continuation-in-part of Ser. No. 405,868, Sep. 11, 1989, Pat. No. 4,947,024. This application Aug. 6, 1990, Ser. No. 563,377

Int. Cl.[5] B23K *9/24*

U.S. Cl. 219—119 **16 Claims**



1. A resistance welding electrode comprising:

(a) a metal body defining a tip having an outer surface which abuts against a metal workpiece during welding; and

(b) a coating on at least a portion of said outer surface, said coating comprising a layer of a ceramic material having a thickness of about 5000 angstroms or less, said ceramic material being selected from the group consisting of a sulfide of tungsten, titanium, molybdenum, or zirconium; a silicide of tentalum or vanadium; and a boride of hafnium, titanium, vanadium, or zirconium.

5,066,846

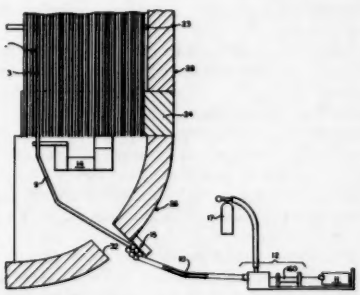
SYSTEM AND METHOD FOR LASER WELDING THE INNER SURFACE OF HEAT EXCHANGER TUBES

William E. Pirl, Levelgreen, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1990, Ser. No. 543,983

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **23 Claims**



1. A system for laser welding the inner surface of a conduit, comprising:

an elongated tubular housing having a distal and a proximal end;

a laser source for generating light energy;

a light conduit for conducting light energy generated by the laser source through said tubular housing;

a beam deflection assembly rotatably mounted on the distal end of said housing and optically connected to said light conduit for directing said light energy to the inner surface of the conduit, and

a rotary drive assembly for rotating said beam deflection assembly to direct said light energy around the inner surface of the conduit, including a motion transducer for converting linear movement parallel to the longitudinal axis of the housing to rotary motion, said transducer having a driven member including a follower means disposed in said housing and connected to said beam deflection assembly, and an elongated drive member axially movable within said housing that includes a helical groove that receives said follower means.

5,066,847

AUTOMATIC WELDING MACHINE PATH CORRECTION METHOD

Hajimu Kishi, Hino; Tohru Mizuno, Tama, and Yuichi Kanda, Kitakata, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

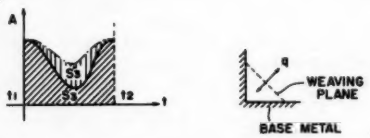
PCT No. PCT/JP88/00396, § 371 Date Oct. 28, 1988, § 102(e) Date Oct. 28, 1988, PCT Pub. No. WO88/08350, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 22, 1988, Ser. No. 269,742

Claims priority, application Japan, Apr. 23, 1987, 62-100912

Int. Cl.[5] B23K *9/127*

U.S. Cl. 219—124.34 **1 Claim**



1. A path correction method in an automatic welding machine in which a torch of a welding machine is grasped by a robot and welding is performed while the welding torch is weaved to the left and right of a welding line, which method comprises the steps of:

computing, every half cycle, an integrated value of welding current of the torch weaved with respect to a given welding line;

deciding a correction direction;

deciding an amount of correction by performing a computation, which is based on said integrated value, in dependence upon the correction direction and

correcting a weaving path of said torch every half cycle by multiplying the decided amount of correction by a predetermined coefficient;

wherein welding is performed while the welding torch is weaved in a weaving plane to the left and right of a welding line, and method includes storing a reference value of the integrated value of said half cycle of welding current determining an actual integrated value of said half cycle, comparing said reference value to said actual integrated value, and determining a correction amount in a direction which will vary a distance between the weaving plane and a workpiece in dependence upon a difference in the actual integrated value with respect to said reference value.

5,066,848

AUTOMATIC COPYING METHOD FOR A WELDING TORCH IN AN ARC WELDING ROBOT

Seigo Nishikawa; Shinji Okumura; Tadayuki Amano, and Kazutoshi Hata, all of Kitakyushu, Japan, assignors to Kabushiki Kaisha Yaskawa Denkiseisakusho, Kukuoka, Japan

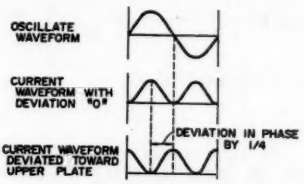
Division of Ser. No. 291,304, Dec. 28, 1988, Pat. No. 4,937,426.

This application Apr. 25, 1990, Ser. No. 514,553

Claims priority, application Japan, Dec. 28, 1987, 62-329720; Feb. 19, 1988, 63-38074

Int. Cl.[5] B23K *9/127*

U.S. Cl. 219—124.34 **2 Claims**


OSCILLATE WAVEFORM
CURRENT WAVEFORM WITH DEVIATION "0"
DEVIATION IN PHASE BY 1/4
CURRENT WAVEFORM DEVIATED TOWARD UPPER PLATE

1. A method of correcting the travel path of an oscillating robotic welding torch, said robotic welding torch tracing a groove line defined by an upper and lower plate and oscillating laterally relative said groove line to define a center of oscillation and opposite first and second ends of oscillation, said fist end of oscillation extending towards the upper plate and said second end of oscillation extending towards the lower plate, said robotic welding torch having a welding current which has a value related to a distance between the robotic welding torch and the upper and lower plate, said method comprising the steps of:

extracting a current component signal of the welding current having a frequency which is twice an oscillating frequency of the robotic welding torch; and,

determining a travel path adjustment of the robotic vehicle according to a phase deviation between the current component signal and an oscillating frequency signal of the oscillating robotic welding torch.

5,066,849

SOLDERING IRON FOR SURFACE MOUNTED COMPONENTS

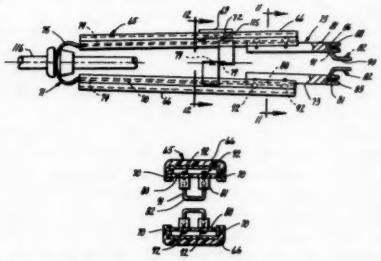
Cornelius T. DeKam, 24565 Tamarack Circle, Southfield, Mich. 48075

Division of Ser. No. 000,204, Jan. 2, 1987, Pat. No. 4,822,979.

This application Apr. 10, 1989, Ser. No. 335,886

Int. Cl.[5] H05B *1/02;* **B23K** *3/02*

U.S. Cl. 219—233 **12 Claims**



1. In an electrically heated soldering iron of the type having at least one soldering tip heated by an electric heating element, the improvement which comprises:

said soldering iron comprising a pair of said soldering tips, each tip comprising a pair of conductors made from dis-

similar metals joined together to unitarily provide the soldering tip, the heating element and a thermocouple for sensing the temperature of the tip, an end portion of one conductor being joined to an end portion of the other conductor to provide the soldering tip and the other end portions of the conductors being operatively connected to a power supply such that when current is supplied to the conductors, the soldering tip is heated and a voltage is generated by said joined end portions indicative of the temperature of said tip;

a pair of channel-shaped arms each supporting one of said pair of soldering tips, said arms adapted to be rotatably joined together at one end portion and resiliently biased apart from each other to a normally open position, and selectively adjustable toward each other by a user to an operative position with said soldering tips in juxtaposition;

a unitary member attached to both of said arms for rotatably joining together said arms and resiliently biasing them apart from each other;

a pair of overlapping members attached to said arms for defining said normally open position;

means mounting said soldering tips to the other end of said arms; and

said power supply operatively connected to said end portions of the dissimilar conductors for heating said conductors and generating a voltage indicative of the temperature of said conductors.

5,066,850

SOLDERING APPARATUS OF A REFLOW TYPE

Kenshi Kondo, Tokyo, Japan, assignor to Nihon Den-Netsu Keiki Co., Ltd., Tokyo, Japan

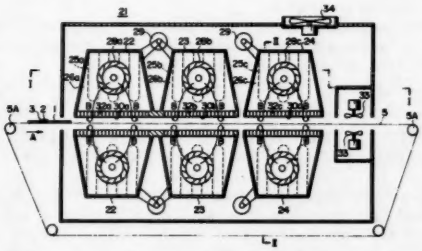
Filed Oct. 3, 1989, Ser. No. 416,456

Claims priority, application Japan, Oct. 4, 1988, 63-249053

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] F27B *9/24;* B23K *1/005*

U.S. Cl. 219—388 **3 Claims**



1. In a reflow type soldering apparatus having a conveyor means for conveying through the apparatus a printed circuit board on which a chip is temporarily mounted with a solder paste, a preheating chamber for preheating the printed circuit board, a reflow chamber for achieving soldering of the chip on the printed circuit board by fusion of the solder paste, and a fan in each of the chambers for circulating air through each respective chamber, the improvement comprising:

a first heater mounted adjacent to a side wall of the preheating chamber, said side wall of the preheating chamber extending along the direction of conveyance of the printed circuit board;

a first screening member mounted adjacent to said first heater so as to prevent direct radiation of radiant heat into the preheating chamber and to the printed circuit board, said first screening member defining with said preheating chamber side wall a first heating subchamber for heating air therein;

a second heater mounted adjacent to a side wall of the reflow chamber, said side wall of the reflow chamber extending along the direction of conveyance of the printed circuit board;

a second screening member mounted adjacent to said second heater so as to prevent direction radiation of radiant heat into the reflow chamber and to the printed circuit board; said second screening member defining with said reflow chamber side wall a second heating subchamber for heating air therein;

a first air inlet and a first air outlet disposed in said preheating chamber to permit circulation of heated air in said preheating chamber, said first inlet directing air through said first heating subchamber and to the circulating fan in said preheating chamber, and said first outlet directing heated air toward said conveyor means to preheat said printed circuit boards;

a second air inlet and a second air outlet dispoed in said reflow chamber to permit circulation of heated air in said reflow chamber, said second inlet directing air through said second heating subchamber and to the circulating fan in said reflow chamber, and said second outlet directing heated air toward said conveyor means to heat and fuse the solder paste; and

an air flow transforming member provided in each of said first and second air outlets, downstream of each of said ciruclating fans, to provide a uniform flow of non-turbulent heated air toward said conveyor means,

the fan and air flow transforming member in each of said preheating and said reflow chamber being disposed to direct non-turbulent heated air substantially evenly and uniformly across the width of said conveyor means to evenly heat the printed circuit board across the width of the board.

5,066,851

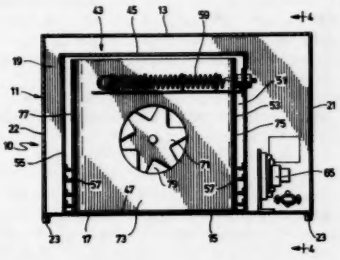
FORCED CONVECTION OVEN

Richard M. Darvin, Richardson, Tex., assignor to QNC, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 422,233, Oct. 2, 1989, Pat. No.

Int. Cl.[5] A21B *1/26, 1/22;* F24C *15/32*

U.S. Cl. 219—400 **6 Claims**



1. Forced convection cooking apparatus comprising:

a housing defining an enclosed cooking chamber which substantially prevents entrance or escape of air;

a resistance heater suspended in the upper portion of the cooking chamber;

a first opening in the front face of said cooking chamber adapted to receive a cooking tray;

a cooking tray positioned near the bottom of the cooking chamber for supporting food to be cooked and adapted to permit liquids to drip therethrough and air to flow therethrough, said cooking tray removably fitting within said first opening to prevent the flow of air through said first opening;

a handle on the front of the cooking tray for facilitating removal and insertion of the cooking tray from said first opening;

a second opening in said front face adapted to receive and support a drip tray below said cooking tray;

a drip tray removably fitting within said second opening to prevent the flow of air through said second opening and positioned below said cooking tray to receive liquids dripping from said cooking tray;

a handle on the front of said drip tray for facilitating removal and insertion of the drip tray from said second opening;

a vertical baffle positioned near the rear of the cooking chamber and having a hole wherein air can flow through the hole and around the sides of the vertical baffle; and

a fan for drawing air through the hole toward the rear of the cooking chamber and for forcing air around the sides of the baffle toward the front of the cooking chamber.

5,066,852

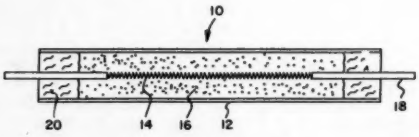
THERMOPLASTIC END SEAL FOR ELECTRIC HEATING ELEMENTS

Henry O. Willbanks, Cookeville, Tenn., assignor to Teledyne Ind. Inc., Cookeville, Tenn.

Filed Sep. 17, 1990, Ser. No. 583,248

Int. Cl.[5] H05B *3/10*

U.S. Cl. 219—544 **11 Claims**



1. An electric heating device comprising:

a generally tubular sheath;

an elongated coil of electrical resistance heating wire passing through a portion of said sheath and spaced therefrom;

an elongated first metal terminal arranged at one end of said sheath, one end of said first terminal being electrically connected to one end of said wire at the interior of said sheath and spaced therefrom, the other end of said first terminal being disposed at the exterior of said sheath;

an elongated second metal terminal arranged at the other end of said sheath, one end of said second terminal being electrically connected to the other end of said wire at the interior of said sheath and spaced therefrom, the other end of said second terminal being disposed at the exterior of said sheath;

a mass of granular, heat conducting, electrically insulating material disposed within said sheath and embedding said wire and said terminals and retaining said wire and said terminals in spaced relation with said sheath;

a seal disposed at least one end of said sheath between said terminal and said sheath, said seal formed of a thermoplastic material having a melting temperature in the range of the temperature of the terminal when the heating device is in heated condition, said thermoplastic material being substantially permeable to gases while melted, and substantially impermeable to gases while solid.

5,066,853

SYSTEM FOR RESERVING A SUPPLY OF GOODS OR SERVICES

Pierre Brisson, Meyrargues, France, assignor to SGS Thomson Microelectronics SA, Gentilly, France

Filed Sep. 20, 1988, Ser. No. 247,085

Claims priority, application France, Sep. 21, 1987, 87 13017

Int. Cl.[5] G06F *15/21, 7/10*

U.S. Cl. 235—381 **4 Claims**

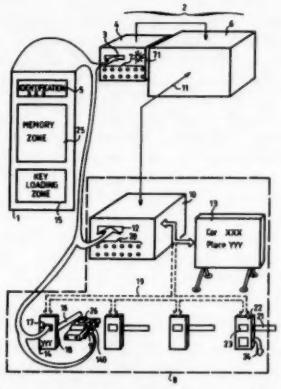
1. A system for reserving the supply of a good or service to be obtained by self-service, said system comprising

chip cards assigned to customers of said good or service,

a central reservation device having a card reading apparatus designed to receive a customer card during a reservation operation, and interface means for communication with a customer, said central reservation system capable of writing in the card information relating to a reservation made by the owner of the card through said interface means,

local terminals connected to said central reservation device and remote from said central reservation device, said local terminals adapted to receive a customer card,

means associated with and controlled by each of said local terminals for physically delivering said good or service near said local terminal in response to information stored in the same card with which reservation of the good or service has been made,



wherein means are provided at said local terminal to write in the card an access key for one specific good or service among the available goods or services at that local terminal,

said means for physically delivering a good or service comprise a card reading apparatus located at a remote place from said local terminal where said specific good or service is available, and

means for enabling delivery of said specific good or service in response to reading said access key from the card in said last mentioned card reading apparatus.

5,066,854

METHOD OF AND APPARATUS FOR GUIDING A SELF-STEERING VEHICLE ALONG AN OPTICAL GUIDEWAY

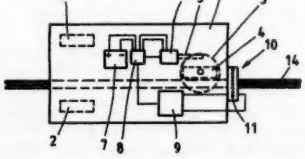
Urs Meyer, Niederglatt; Rene F. Oberhansli, Wiesendangen, and Dominik Häusler, Unterageri, all of Switzerland, assignors to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Feb. 14, 1990, Ser. No. 480,205

Claims priority, application Switzerland, Feb. 16, 1989, 00538/89

Int. Cl.[5] G05B *1/00*

U.S. Cl. 250—202 **24 Claims**



1. A method of guiding a self-steering vehicle along an optical guideway, comprising the steps of:

scanning the optical guideway by means of light pulses emitted in a predetermined frequency by sensors compris-

ing the step of using a row of individual sensors providing analog measurement values and the further step of digitally processing the analog measurement values;

said step of using a row of individual sensors comprising the step of using transmitters which emit light pulses and receivers which receive light pulses, said sensors being transversely arranged relative to the direction of travel of the vehicle;

said step of scanning the optical guideway comprising the step of successively effecting the scanning operation in chronological sequence relative to the number of sensors;

generating a signal from the intensity of the reflected light, received by said receivers, by means of an electronic evaluation unit comprising the step of evaluating the reflected light signals by means of a computer unit; and

using the signal to control a steering mechanism.

5,066,855

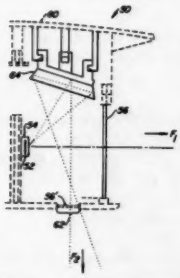
INFRARED INTRUSION DETECTOR

Wade Lee, Alamo, Calif., assignor to Intelectron, Hayward, Calif.

Filed Jan. 24, 1990, Ser. No. 469,630

Int. Cl.[5] G01V *9/04*

U.S. Cl. 250—221 **11 Claims**



1. In an infrared intrusion detection device having a first field of view including a first optical path having a fresnel lens array disposed in front of an infrared radiation sensor to direct incident radiation directly onto the sensor, the improvement comprising:

a housing encompassing a portion of the first optical path, said portion including the lens array and the sensor;

said housing having a first and a second aperture, with said first aperture disposed to provide the first field of view and the second aperture disposed to provide a second field of view at least about ninety degrees to the first field of view, said aperture permitting incident infrared radiation received from said second field of view to enter said housing along a second optical path; and

an optical element disposed in said housing along said second optical path, said optical element directing said incident infrared radiation received from said second field of view to said sensor.

5,066,856

OPTICAL MICRO-SWITCH APPARATUS

Ronald J. Crouse, Dallas, Tex., assignor to Optoswitch, Inc., McKinney, Tex.

Filed Mar. 23, 1990, Ser. No. 498,811

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—229 **20 Claims**

1. An optical switch comprising:

a housing:

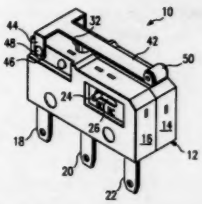
an input lead, an output lead and a common lead extending from said housing;

a light-emitting device position within said housing and operatively connected at least between said input lead and said common lead;

a light-sensing device positioned within said housing and operatively connected at least between said output lead and said common lead, said light-sensing device and said light-emitting device disposed at respective ends of a light transmission path;

an operator-movable means positioned in said light transmission path, movable between a first position which configures the optical switch for normally switch-open position and operation and a second position which configures the optical switch operation and a second position which configures the optical switch for normally switch-closed position and operation and including light-blocking means and light-passing means; and

a switch-actuating means positioned in said light transmission path, movable between a first position and a second position and including light-blocking means and light-passing means;



whereby said optical switch is in the switch-open position without an output voltage available on said output lead and with the light transmission path blocked when said operator-movable means and said switch-actuating means are both positioned in said first position, said optical switch is in the switch-open position with the light transmission path blocked when said operator-movable means and said switch-actuating means are both position in said second position, said optical switch is the switch-closed position with an output voltage available on said output lead and with the light transmission path not blocked when said operator-movable means is positioned in said first position and said switch-actuating means is positioned in said second position, said optical switch is in the switch-closed position with the light transmission path not blocked when said operator-movable means is positioned in said second position and said switch-actuating means is positioned in said first position.

5,066,857

INCREMENTAL ANGLE ENCODER HAVING SPIRAL SCANNING FIELD AND MULTIPLE DISCS

Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenheim GmbH, Traunreut, Fed. Rep. of Germany

Filed Aug. 13, 1990, Ser. No. 566,550

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1989, 3926799

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.15 **21 Claims**

1. An incremental angle encoder which generates signals from which the number of revolutions can be determined thereby indicating an absolute measurement comprising:

a first disk having an incremental angular graduation and at least a first reference mark and a second reference mark;

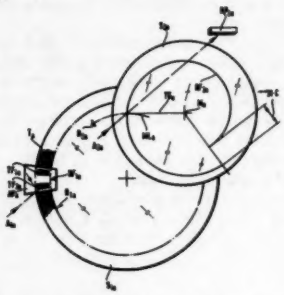
an encoder shaft connected to said first disk;

a second disk having a spiral shaped reference scanning field;

a second shaft connected to said second disk;

a reduction gear connecting said encoder shaft with said second shaft wherein said reduction gear creates a reduction ratio between said first disk and said second disk; and

scanning means for generating a first reference signal by scanning said first reference mark on said first disk and a second reference signal by means of scanning said second



reference mark through said spiral shaped reference scanning field of said second disk wherein the number of revolutions of said encoder shaft is determined by the offset between the first and second reference signals.

5,066,858

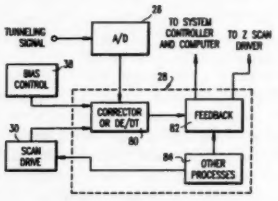
SCANNING TUNNELING MICROSCOPES WITH CORRECTION FOR COUPLING EFFECTS

Virgil B. Elings, and John A. Gurley, both of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Goleta, Calif.

Filed Apr. 18, 1990, Ser. No. 510,612

Int. Cl.[5] H01J *37/00*

U.S. Cl. 250—307 **28 Claims**



1. A method of correcting a scanning tunneling microscope system for coupling effects of parasitic impedances and geometric capacitance, said scanning tunneling microscope system comprising a scanning tip and a signal lead connected to said tip constituting a tunneling current circuit, a transducer for scanning said tip over a surface of a sample to be observed by said microscope system and to move said tip towards and away from said surface, electrodes on said transducer, means for applying scan drive voltages to said electrodes, and bias means for applying a bias voltage to said sample, said method comprising:

withdrawing said tip to a position at which no tunneling current will flow from said sample;

applying a test signal to one of said electrodes and bias means;

acquiring the response induced in said tunneling current circuit in response to said application of said test signal;

determining from said response the correction required by said scanning tunneling microscope system to correct for said coupling effects; and

using said correction when said tip is lowered to a position at which tunneling current will flow from the sample to said tip to correct said tunneling current for said coupling effects.

5,066,859

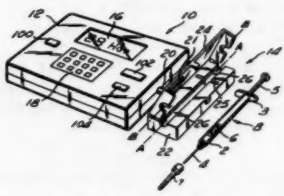
HEMATOCRIT AND OXYGEN SATURATION BLOOD ANALYZER

Maurice N. Karkar, 26842 Calle Maria, Mission Viejo, Calif. 92692, and James C. Velnosky, 6014 Amethyst Ave., Alta Loma, Calif. 91701

Filed May 18, 1990, Ser. No. 526,184

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—339 **26 Claims**



1. An apparatus for measuring hematocrit and oxygen saturation levels of a volume of blood, comprising:

a housing including a key pad and display panel thereon;

a receptacle sized to store a quantity of blood therein;

a carriage electrically connected to said housing, said carriage being sized and configured to receive and support said receptacle;

a light source disposed adjacent said carriage, said light source being operative to illuminate said quantity of blood within said receptacle with first and second wavelengths of light;

a first sensing means disposed adjacent said carriage for producing a hematocrit signal as a function of said first wavelength of light after scattering thereof by said blood;

a second sensing means disposed adjacent said carriage for producing an oxygen saturation signal as a function of said first and said second wavelengths of light after scattering thereof by said blood;

a third sensing means disposed adjacent said carriage for producing a calibration signal for the purpose of calibrating said apparatus; and

a signal processing means disposed within said housing, said signal processing means comprising:

(a) means for filtering said hematocrit signal and said oxygen saturation signal from system noise and outside interference;

(b) means for producing an adjusted hematocrit signal and an adjusted oxygen saturation signal, said adjusted hematocrit signal comprising said hematocrit signal as compensated for effects of oxygen saturation, temperature, and blood pH and said adjusted oxygen saturation signal comprising said oxygen saturation signal as compensated for effects of hematocrit, temperature, and blood pH; and

(c) means for converting said adjusted hematocrit signal and said adjusted oxygen saturation signal to hematocrit and oxygen saturation measurements for output on said display panel.

5,066,860

OPTICAL SENSOR

Helmut Zinner, Haar, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 452,114, Dec. 15, 1989, abandoned. This application Apr. 1, 1991, Ser. No. 680,606

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843470

Int. Cl.[5] G01C *21/12*

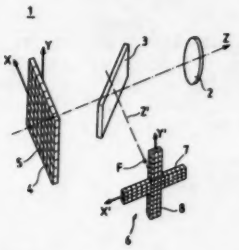
U.S. Cl. 250—349 **10 Claims**

1. An optical sensor for detecting a target and for determin-

ing characteristic motion of a missile approaching the target, comprising:

an optical system having a focal plane for forming an image of a scene containing the target lying within a field of view of the optical system onto at least a first and a second detector;

the first detector comprising a plurality of first detector



elements configured in a planar matrix, and the scene containing the target being sharply imaged onto said first detector elements;

the second detector comprising at least two intersecting sensor bars having a group of second detector elements lying outside of the focal plane of the optical system, so that an image of a target point situated at infinity is imaged onto several second detector elements.

5,066,861

X RAY DETECTING DEVICE

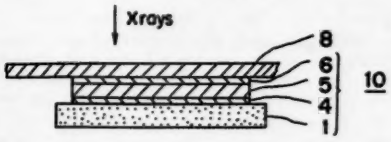
Takehisa Nakayama; Akimine Hayashi; Masataka Kondo; Satoru Murakami; Minori Yamaguchi; Yoshihisa Tawada; Masahiko Hosomi, all of Hyogo, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Jan. 19, 1989, Ser. No. 299,103

Claims priority, application Japan, Jul. 22, 1987, 62-184056; Aug. 7, 1987, 62-198377; Aug. 7, 1987, 62-198378; Oct. 28, 1987, 62-272640; Oct. 28, 1987, 62-272641; Oct. 28, 1987, 62-272642

Int. Cl.[5] G01T *1/20*

U.S. Cl. 250—370.09 23 Claims



1. An X ray detecting device for placement between an X ray source and an object to be measured or an X ray photographic film comprising:

XL converting means for receiving X rays and generating visible light, the intensity of the generated visible light corresponding to the intensity of the received X rays, and

LE converting means for receiving the light generated from said XL converting means and generating an electrical signal corresponding to the intensity of the visible light, said LE converting means comprising a base layer, an amorphous semiconductor light to electric converting layer, and electrode means for deriving the electric signal, said LE converting means being made not to substantially absorb the X rays.

5,066,862

DEVICE FOR DETECTING IONIZING RADIATION

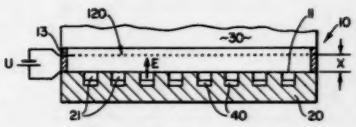
Heinz Filthuth, Bahnhofstrasse 29, D-7540 Neuenburg, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 522,714

Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915612

Int. Cl.[5] H01J *47/00*

U.S. Cl. 250—393 8 Claims



1. A device for detecting low energy ionizing radiation emanating from a plurality of samples, said device comprising: a receptacle having a surface and provided with a plurality of recesses each for holding a respective sample, each said recess being open at said surface; a cover member separate from said receptacle and having at least one planar electrically conductive member provided with openings, said conductive member being spaced from said receptacle and being disposed parallel to said surface; and a voltage source means connected between said receptacle and said conductive member to place said electrically conductive member at a potential which is positive relative to the potential of said surface and to create an electric field which substantially extends from said receptacle surface to said electrically conductive member.

5,066,863

ASCERTAINING HIGH ENERGY RADIATION

Ferdinand Hanisch, Burgwedel, and Eckard Schleese, Stadthagen, both of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/DE89/00108, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO89/08267, PCT Pub. Date Sep. 8, 1989

PCT Filed Feb. 24, 1989, Ser. No. 439,035

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806867

Int. Cl.[5] G01T *1/04, 3/00*

U.S. Cl. 250—474.1 28 Claims

1. Device for ascertaining the integral and cumulative dosage of high energy radiation to be ascertained in particular locations comprising, an extruded strand element of elongated construction of selectible length that has been cut from a considerably longer strand, and including a polymeric host material; alanine added to the host, said alanine undergoes molecular changes subject to detection; and a pigment included in the strand, which undergoes optical variations which are visible on exposure to high energy radiation.

5,066,864

STIMULABLE PHOSPHOR RADIATION IMAGE STORAGE SCREEN HAVING AN ANTI-REFLECTION LAYER

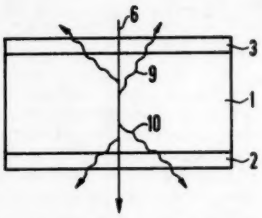
Gerhard Brandner, Zirndorf, and Peter Hoebel, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,651

Claims priority, application European Pat. Off., Feb. 7, 1990, 90102430

Int. Cl.[5] G03B *42/00*

U.S. Cl. 250—484.1 9 Claims



1. A luminescent storage screen for storing latent x-ray images, said storage screen being read-out by excitation with stimulating radiation having a first wavelength, said storage screen comprising:

a stimulable phosphor in which said x-ray image is latently stored which is reactive to said radiation of first wavelength to emit radiation of a second wavelength; and

at least one optical layer coating a surface of said stimulable phosphor layer for reducing reflections at least of said radiation having said first wavelength and being highly transmissive at least for said radiation having said first wavelength.

5,066,865

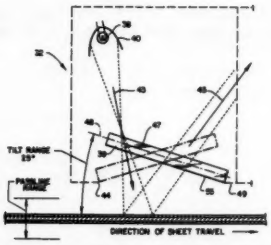
SINGLE SIDED REFLECTANCE SENSOR FOR MEASURING SELECT PHYSICAL PROPERTIES OF A MATERIAL USING ONE OR MORE WAVELENGTHS OF RADIATION

Gunnar Wennerberg, Cupertino, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Sep. 1, 1989, Ser. No. 401,942

Int. Cl.[5] G01N *21/88*

U.S. Cl. 250—572 18 Claims



1. A sensor, substantially insensitive to sheet flutter, for measuring a select physical property of a traveling sheet having a machine-direction and a cross-direction, and first and second major surfaces, comprising:

an electromagnetic radiation source disposed for projecting an incident beam onto the first surface of the sheet;

an elongated convex lens located in the optical path between the electromagnetic radiation source and the first surface of the sheet, for projecting the beam onto the first surface of the sheet, the lens being disposed with respect to the sheet so that the lengthwise axis of the lens and the machine-direction of the sheet form an angle of anywhere between ±25 degrees at the trailing edge of the lens and so that the beam projected onto the first surface of the sheet is smaller in the cross-section than in the machine direction; and

reflectance sensing means for sensing the intensity of the portion of the beam reflected from the first surface of the sheet.

5,066,866

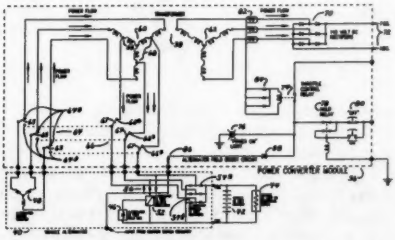
POWER CONVERTER SYSTEM

William M. Hallidy, 620 E. Laurel Ave., Glendora, Calif. 91740

Filed Dec. 26, 1989, Ser. No. 456,990

Int. Cl.[5] H02P *9/00*

U.S. Cl. 290—1 R 11 Claims



1. An electric power generating apparatus for use with the electrical system of an engine-driven vehicle, the apparatus comprising:

an engine-driven alternator having a rotor with magnetic poles and with a field coil adapted to receive an electric current and thereby produce lines of magnetic flux in said magnetic poles, a stator armature having windings that generate a voltage in response to said lines of magnetic flux when the rotor is rotated in respect to said stator, and output terminals connected to said windings;

voltage regulator means, having an input terminal, for controlling the magnitude of the current in the rotor field coil such that the voltage regulator means allows the field coil current to increase or decrease until a voltage of a predetermined level is received at the voltage regulator means input terminal;

a transformer having a primary winding with input terminals connected to the full primary winding, taps connected to a portion of the primary winding to provide a reduced portion of the full voltage applied to said input terminals, and a secondary winding with output terminals;

first switching means for switching the apparatus between a normal power state and a high power state, wherein the switching means in the normal power state directs substantially all of the voltage generated in the stator windings to the vehicle electrical system and to the voltage regulator means input terminal, and in the high power state directs substantially all of the voltage generated in the stator windings to the primary winding of the transformer; and

second switching means wherein said second switching means in the high power state directs the reduced portion of the full alternator generated voltage from the taps on the transformer primary winding to the vehicle electrical system and to the voltage regulator means; wherein

the voltage regulator means, in response to said reduced portion of the full alternator generated voltage applied to the voltage regulator means, increases the field coil current and thereby causes the alternator to generate a higher than normal voltage in the full stator windings to maintain the reduced portion of the full alternator generated voltage at the predetermined voltage level at the voltage regulator means input terminal.

5,066,867

METHOD AND DEVICE FOR GENERATING ELECTRIC POWER BY USE OF WAVE FORCE

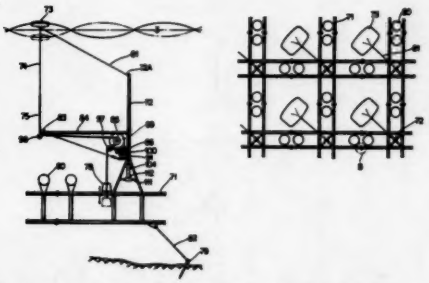
Hyun J. Shim, 350-39 Sangdo 3-dong, Dongjak-ku, Seoul, Rep. of Korea

Filed Jul. 6, 1987, Ser. No. 70,353

Claims priority, application Rep. of Korea, Jul. 7, 1986, 5475/1896

Int. Cl.[5] F03B *13/10, 13/12*

U.S. Cl. 290—53 3 Claims



1. A device for generating electric power from waves on a surface of a body of water, comprising:

a lattice-shaped frame;

a rotary column mounted on said frame;

a floatation bladder floating up-and-down on the water surface in response to rise and fall motion of the waves;

means for transmitting the up-and-down motion of the floatation bladder to a transducer, including a chain coupled to said floatation bladder and a plurality of sprockets being coupled to said rotary column and rotating in gear with the chain; and

means for maintaining said frame at a predetermined depth under mean water level.

5,066,868

APPARATUS FOR GENERATING PHASE SHIFTED CLOCK SIGNALS

James H. Doty, II; David L. Albean, and Harold Blatter, all of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Aug. 13, 1990, Ser. No. 566,182

Int. Cl.[5] H03K *5/00, 19/20, 5/159, 5/13*

U.S. Cl. 307—262 5 Claims

1. Apparatus for generating a phase shifted clock signal comprising:

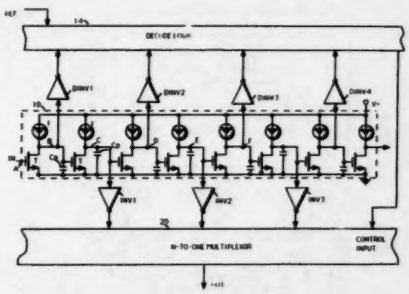
a clock input terminal for applying a clock signal;

a plurality of similar inverting amplifiers, each having input and output terminals, one of said amplifiers having its input terminal coupled to said clock input terminal, and the remaining amplifiers coupled in cascade with the one of said amplifiers wherein the output terminal of a preceding amplifier is coupled to the input terminal of a succeeding amplifier;

a plurality of similar valued capacitances respectively coupled between the output terminals of each of said amplifiers and a point of substantially constant potential;

signal selection means having a plurality of input terminals, and an output terminal for providing said phase shifted clock signal;

a plurality of buffer amplifier means, each having an input terminal exhibiting an impedance, and having respective output terminals, said buffer amplifier means respectively



coupled between respective input terminals of said signal selection means and the output terminals of every other one of said cascade connected amplifiers; and

a plurality of circuit means, each having an input terminal exhibiting an impedance which substantially emulates the impedance exhibited by the respective input terminals of said buffer amplifier means, and the input terminals of said plurality of circuit means being coupled to respective output terminals of inverting amplifiers which are not coupled to said buffer amplifier means, for providing delayed representations of said clock signal.

5,066,869

RESET CIRCUIT WITH PNP SATURATION DETECTOR

Robert A. Neidorff, Bedford, N.H., assignor to Unitrode Corporation, Lexington, Mass.

Filed Apr. 9, 1990, Ser. No. 506,465

Int. Cl.[5] H03K *17/20, 17/22, 17/16, 3/013*

U.S. Cl. 307—272.3 6 Claims

1. A reset circuit including an NPN transistor with a PNP transistor forming a saturation detector, comprising:

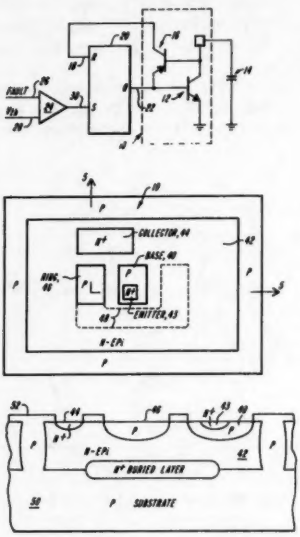
an NPN transistor including base, emitter and collector regions;

a PNP transistor including base, emitter and collector regions, energizable in response to saturation of said NPN transistor; and

a latch circuit element having set and reset input control ports and at least one output port, said reset input port coupled to the collector of said PNP transistor, and said at least one output port coupled to the base of said NPN transistor and emitter of said PNP transistor; and

said at least one output port responsive to an input signal on said input port for energizing said NPN transistor, and

responsive to the energization of said PNP transistor input on said reset input port, for de-energizing said NPN transistor as a function of said PNP transistor detecting saturation of said NPN transistor.

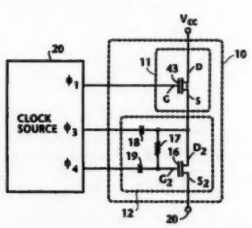


5,066,870

CHARGE PUMP HAVING PULL-UP CIRCUIT OPERATING WITH TWO CLOCK PULSE SEQUENCES

Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 541,808
Claims priority, application Japan, Jun. 20, 1989, 1-158587
Int. Cl.[5] H03K *3/01, 5/13, 19/01;* **H03L** *5/00*
U.S. Cl. 307—296.1 **12 Claims**



1. A charge pump comprising:

a charge-up circuit connected to a voltage source;

clock generator means for generating first and second clock pulse sequences respectively at first and second output terminals of the clock generator means;

a field-effect transistor having a drain-source path connected between said charge-up circuit and an output terminal of the charge pump, and a gate electrode; and

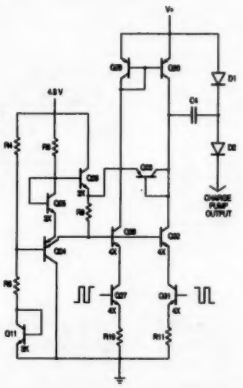
a time constant circuit having first and second capacitive elements and a resistive element connected therebetween, said time constant circuit being connected across said first and second output terminals of said clock generator means for successively applying voltages to one end of the drain-source path and gate electrode of said transistor in response to said first and second clock pulse sequences.

5,066,871

MAXIMUM SWING CASCODE CIRCUIT FOR A BIPOLAR CHARGE PUMP

Milton E. Wilcox, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 433,505, Nov. 8, 1989, abandoned. This application May 9, 1991, Ser. No. 698,365
Int. Cl.[5] H03K *3/01;* **H02M** *3/18*
U.S. Cl. 307—296.1 **3 Claims**



1. A bipolar charge pump that generates an output voltage greater than its supply voltage, the charge pump comprising:

(a) a pump capacitor having a first plate connected to the supply voltage via a first diode and a second plate selectively connectable to the supply voltage or to ground;

(b) a firsts NPN cascode transistor having a base, collector and an emitter;

(c) a first NPN input transistor having a base, a collector and an emitter, the collector of the first input transistor connected to the emitter of the first cascode transistor to form a cascode connection therebetween, the emitter of the first input transistor connected to ground via first resistive element;

(d) a second NPN cascode transistor having a base, a collector and an emitter, the collector of the second cascode transistor connected to the second plate of the group capacitor;

(e) a second NPN input transistor having a base, a collector and an emitter, the collector of the second input transistor connected to the emitter of the second cascode transistor to form a cascode connection therebetween, the emitter of the second input transistor connected to ground via a second resistive element;

(f) a current mirror comprising first and second PNP current mirror transistor, each current mirror transistor having a base, a collector and an emitter, the base of the first current mirror transistor connected to the base of the second current mirror transistor, the base of the first current mirror transistor connected to the collector of the first current mirror transistor, the emitter of the first current mirror transistor connected to the supply voltage, the collector of the second current mirror transistor connected to the second plate of the pump capacitor, the emitter of the second current mirror transistor connected to the supply voltage;

The base of the first input transistor and the base of the second input transistor being responsive to first and second opposing square waves, respectively, for causing current to alternately flow through the first cascode transistor and the second cascode transistor to the current mirror thereby switching the second plate of the pump capacitor between a low potential when the second cascode transistor is turned on and the supply voltage when

the first cascode transistor and the current mirror are turned on; and

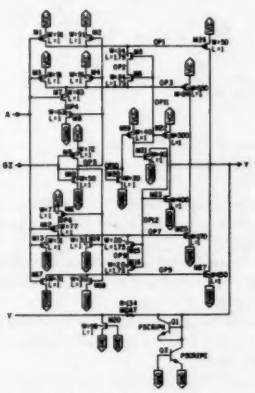
(g) a biasing network connected to the collector of the second cascode transistor for preventing the second cascode transistor from saturating when the second plate of the pump capacitor is switched to the low potential.

5,066,872

SPEED-UP TECHNIQUE FOR A CONSTANT DI/DT BUFFER

Stephen R. Schenck, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 11, 1990, Ser. No. 535,815
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—443 **20 Claims**



1. An electronic circuit which comprises:

(a) an input node for receiving an input voltage signal;

(b) an output node;

(c) a first transistor coupled to said output node;

(d) voltage control circuitry coupled between said input node and said first transistor and responsive to predetermined voltage at said input node to control the voltage driving said first transistor with respect to time to provide a constant rate of change of current with respect to time in said first transistor; and

(e) a second transistor coupled to said output node and responsive to said predetermined voltage at said input node to turn on prior to said first transistor.

5,066,873

INTEGRATED CIRCUITS WITH REDUCED SWITCHING NOISE

Yiu-Fai Chan, Los Altos Hills; Chang-Chia Hsiao, Cupertino, and James A. Watson, Santa Clara, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Dec. 4, 1989, Ser. No. 444,993
Int. Cl.[5] H03K *17/16, 5/12, 19/003*
U.S. Cl. 307—443 **25 Claims**

1. An integrated circuit comprising:

a source of relatively high potential,

a source of relatively low potential,

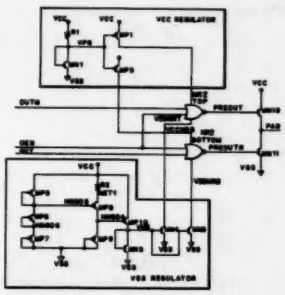
an output pad,

an output driver circuit for selectively connecting said output pad to either of said sources,

at least one NOR gate for producing an output signal for controlling said output driver circuit, said NOR gate having logical inputs whose logical states determine the logical state of said output signal, a first reference voltage input for receiving a relatively high reference voltage, and a second reference voltage input for receiving a relatively low reference voltage input, the difference between said first and second reference voltages influencing the speed at which said NOR gate output signal changes logical state in response to changes in the logical states of said logical inputs,

first means for connecting said source of relatively high potential to said first reference voltage input, and

second means for connecting said source of relatively low potential to said second reference voltage input, at least one of said first and second means including:



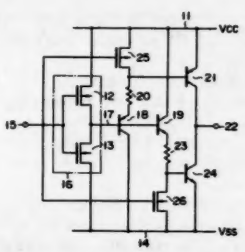
a resistor element connected in series between the associated source and reference voltage input for decreasing the difference between said first and second reference voltages in response to a decrease in the difference between said relatively high potential and said relatively low potential in order to decrease the speed at which said NOR gate output signal changes logical state in response to changes in the logical states of said logical inputs.

5,066,874

SIGNAL OUTPUT CIRCUIT HAVING BIPOLAR TRANSISTOR IN OUTPUT STAGE AND ARRANGED IN CMOS SEMICONDUCTOR INTEGRATED CIRCUIT

Kiichi Koya, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 14, 1990, Ser. No. 612,458
Claims priority, application Japan, Nov. 15, 1989, 1-296567
Int. Cl.[5] H03K *19/01*
U.S. Cl. 307—446 **7 Claims**



1. A signal output circuit comprising:

at least one input terminal;

an output terminal;

first and second nodes for respectively receiving power supply voltages having different values;

a CMOS logic gate for receiving a signal from said input terminal and for generating an output corresponding to the input;

a first bipolar transistor of a first polarity having a base for receiving the output from said logic gate;

a second bipolar transistor of a second polarity having a base for receiving the output from said logic gate;

a first resistor having one terminal connected to an emitter of said first bipolar transistor;

a second resistor having one terminal connected to an emitter of said second bipolar transistor;

a third bipolar transistor of the first polarity having an emitter connected to said first node, a collector connected to said output terminal, and a base connected to the other terminal of said first resistor; and

a fourth bipolar transistor of the second polarity having an emitter connected to said second node, a collector connected to said output terminal, and a base connected to the other terminal of said second resistor.

5,066,875

SIGNAL OUTPUT CIRCUIT HAVING BIPOLAR TRANSISTORS AT OUTPUT, FOR USE IN A MOS SEMICONDUCTOR INTEGRATED CIRCUIT

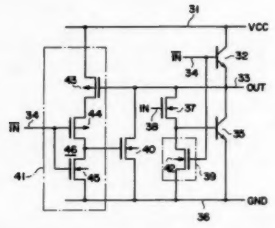
Masaji Ueno, Chofu, and Kumi Ofusa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1990, Ser. No. 592,236

Claims priority, application Japan, Oct. 6, 1989, 1-261577

Int. Cl.[5] H03K *19/096, 17/16*

U.S. Cl. 307—446 **13 Claims**



1. A signal output circuit having a bipolar transistor at an output, for use in a CMOS integrated circuit, said signal output circuit comprising:

a first node for outputting a signal;

a second node to which a first power-supply potential is applied;

a first bipolar transistor of a first polarity having a base and collector-emitter path connected between said first and second nodes;

a first MOS transistor of the first polarity having a source-drain path connected between said first node and the base of said first bipolar transistor, and controlled by a first input signal;

a second MOS transistor of the first polarity having a gate and a source-drain path connected between said first and second nodes; and

a control signal generating means for generating and supplying a control signal to the gate of said second MOS transistor, whereby said second MOS transistor is off while the output signal at said first node is falling to a predetermined level between a first voltage corresponding to a high logical level and a second voltage corresponding to a low logical level, and said second MOS transistor is on after the output signal falls below the predetermined level.

5,066,876

CIRCUIT FOR CONVERTING ECL LEVEL SIGNALS TO MOS LEVEL SIGNALS

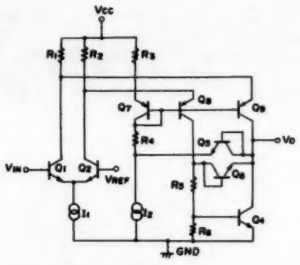
Shinri Fukuda, and Eiichi Ishii, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 21, 1990, Ser. No. 632,167

Claims priority, application Japan, Dec. 28, 1989, 1-344543

Int. Cl.[5] H03K *19/092, 19/086*

U.S. Cl. 307—475 **17 Claims**



1. A transistor circuit comprising:

a first and a second power supply terminal and an output terminal;

a first and a second transistor differentially connected with each other and having bases receiving an input signal therebetween;

a first and a second resistor respectively connected between collectors of said first and second transistors and said first power supply terminal;

a third transistor having an emitter receiving a voltage dropped by said first resistor and a collector connected to said output terminal;

a fourth transistor having an emitter receiving a voltage dropped by said second resistor;

a fifth transistor having a collector connected to said output terminal and an emitter connected to said second power supply terminal;

a first means connected between said first and second power supply terminals for providing biasing voltages to bases of said third and fourth transistors thereby causing said fourth transistor to be in a conductive state when said voltage dropped by said first resistor is larger than that said voltage dropped by said second resistor and causing said third transistor to be in a conductive state when said voltage dropped by said first resistor is smaller than said voltage dropped by said second resistor; and

a second means for rendering said fifth transistor to become conductive when said fourth transistor is in a conductive state.

5,066,877

DATA DELAY CIRCUIT AND CLOCK EXTRACTION CIRCUIT USING THE SAME

Hiroshi Hamano, Kawasaki; Izumi Amemiya, Yokohama; Takuji Yamamoto, Kawasaki; Yasunari Arai, Tokyo, and Takeshi Ihara, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 467,246, Jan. 19, 1990, abandoned. This application Feb. 28, 1991, Ser. No. 662,502

Claims priority, application Japan, Jan. 19, 1989, 1-8645

Int. Cl.[5] H03K *5/13, 5/159*

U.S. Cl. 307—603 **15 Claims**

1. A data delay circuit connectable to receive first and second voltages, to receive input data having a first polarity and to receive control data having a second polarity opposite the first polarity and having an amplitude level corresponding to a desired delay time of the input data, and comprising:

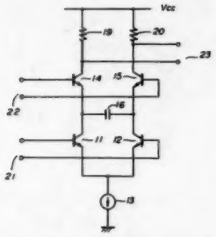
a first transistor having a base connectable to receive the input data, an emitter and a collector;

a second transistor having a base connectable to receive the input data, an emitter and a collector;

a constant-current source coupled to the emitters of said first and second transistors and to receive the first voltage;

a capacitor coupled between the collector of said first transistor and the collector of said second transistor;

a third transistor having a base connectable to receive the control data, a collector, and an emitter coupled to the collector of said first transistor;



a fourth transistor having a base connectable to receive the control data, a collector, and an emitter coupled to the collector of said second transistor,; and

first and second load resistors respectively coupled to the collectors of said third and fourth transistor and to receive the second voltage,

delayed input data being drawn from the collectors of said third and fourth transistors.

5,066,878

SMALL-SIZED ELECTRIC MOTOR HOUSING CIRCUIT BREAKER

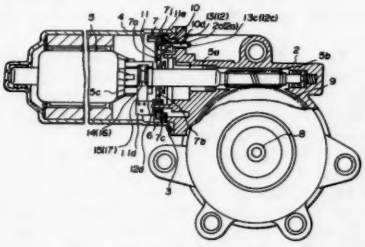
Shuji Sekine; Takeo Furuya, and Katsuhiro Sato, all of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan

Filed Dec. 17, 1990, Ser. No. 628,138

Claims priority, application Japan, Dec. 18, 1989, 1-145707[U]

Int. Cl.[5] H02K *11/00*

U.S. Cl. 310—68 C **4 Claims**



1. A small-sized electric motor comprising:

an armature provided with a commutator;

a brush in contact with the commutator of said armature;

a metallic brush holder directly fitted with said brush;

a fixed metallic holder retainer electrically connected with said brush holder;

a metallic terminal plate;

an electrically insulative holder base attached with said holder retainer and provided with a hole; and

a circuit breaker having a pair of electrical connective plates and inserted into said hole of said holder base together with said holder retainer and said terminal plate such that said electrical connective plates are in contact electrically with said holder retainer and said terminal plate so as to conduct an electric current to said armature through the terminal plate and the holder retainer.

5,066,879

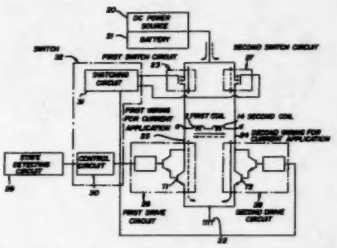
SINGLE POWER SOURCE MAGNETIC BEARING DEVICE

Akira Yamamura, Tokyo, Japan, assignor to Nippon Ferrofluidics Corporation, Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,951

Int. Cl.[5] H02K *7/09*; G05F *1/08*; F16C *32/04*

U.S. Cl. 310—90.5 **1 Claim**



1. A magnetic bearing device, comprising:

a magnetic movable member;

a first supporting member having a first coil and a permanent magnet;

a second supporting member having a second coil and a permanent magnet, a top end of the first coil being connected to a top end of the second coil, said first and second supporting members being located so as to position said movable member therebetween and wherein during operation said movable member is magnetically supported so as not to be in contact with either of said supporting members;

state detecting means for detecting a state of displacement of said movable member;

a first wiring for application of current, said first wiring having a first switch circuit connected to a first drive circuit, a bottom end of the first coil being connected between the first switch circuit and the first drive circuit;

a second wiring for application of current, said first and second wirings being connected in parallel to each other between a dc power source and ground, said second wiring having a second switch circuit connected to a second drive circuit, a bottom end of the second coil being connected between the second switch circuit and the second drive circuit; and

switching means connected to said first and second wirings for switching direction of current applied to the first and second coils by switching to either a simultaneous closing state of said first switch circuit and said second drive circuit or a simultaneous closing state of said second switch circuit and said first drive circuit in accordance with the state detected by said state detecting means.

5,066,880

PERMANENT MAGNET POLYPHASE SYNCHRONOUS MACHINE

Louis Banon, 27 Bd des Italiens, 75002 Paris, France

Filed Apr. 4, 1990, Ser. No. 503,963

Claims priority, application France, Apr. 4, 1989, 89 04414

Int. Cl.[5] H02K *21/12*

U.S. Cl. 310—156 **7 Claims**

1. An apparatus comprising:

a flux concentration rotor including

a shaft made of a non-magnetic material,

parallelopipedal radial disposed permanent magnets adjacent said shaft through which induction flux passes, and

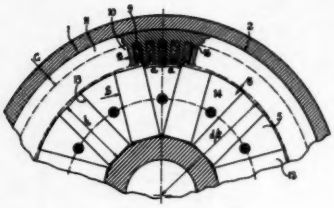
polar pieces disposed between said magnets; and a stator, having a bore diameter, including

a frame,

a plurality of semi-closed notches provided in said frame,

a stator yoke delimiting said notches, and

induction coils received in said notches, said stator and said rotor defining an air gap, said apparatus being constructed in accordance with a first ratio r1 defined by the equation



$$r1 = h/d$$

wherein:

h is a height of a section of one of said magnets, and

d is a bore diameter of said stator,

the value of said first ratio r1 being between 0.19 and 0.27.

5,066,881

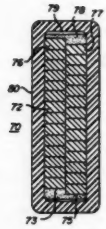
SEMI-CONDUCTING LAYER FOR INSULATED ELECTRICAL CONDUCTORS

Richard K. Elton, Altamont, and William R. Schultz, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 351,235, May 15, 1989, which is a division of Ser. No. 643,908, Aug. 23, 1984, Pat. No. 4,853,565. This application Jul. 23, 1990, Ser. No. 555,621

Int. Cl.[5] H02K *3/14*

U.S. Cl. 310—213 **2 Claims**



1. An internal grading layer for an electrically conductive winding which includes a plurality of conductive strands bundled together in at least two adjacent columns and a first strand of said plurality of conductive strands being transposed with respect to a second strand of said plurality of conductive strands in an adjacent column, an inert transposition filler material disposed proximate said conductive first and second strands to round off that portion of the bundled together conductive strands, said bundled together conductive strands and said filler material being surrounded by an insulative material, the internal grading layer comprising:

a semi-conducting pyrolyzed glass fiber layer having a resistivity in a range of 200 to 10,000,000 ohms per square disposed between said filler material and said insulative material in intimate contact with said insulative material and electrically coupled to said conductive first and second strands.

5,066,882

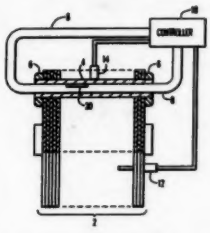
STATOR CORE ASSEMBLY

John B. Sargeant, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1991, Ser. No. 637,721

Int. Cl.[5] H02K *5/04*

U.S. Cl. 310—217 **9 Claims**



1. In a stator core assembly comprising a plurality of steel punchings, and a plurality of fastening devices including bolts holding the punchings together in a stack and pressing adjacent punchings against one another, the bolts being of a material having a coefficient of thermal expansion different from that of the steel punchings, the improvement wherein: said bolts are constituted by hollow tubes; and said assembly further comprises temperature control means for introducing a fluid having a selected temperature to the interior of said tubes in order to minimize temperature dependent changes in the compressive force exerted by said fastening devices on said stack.

7. A method for controlling the compressive force exerted by a plurality of bolts on a stator core assembly, the stator core assembly including a plurality of steel punchings held together in a stack, and pressed against one another, by the bolts, each bolt being constituted by a hollow tube, said method comprising:

monitoring the temperatures of the bolts and the punchings;

causing a fluid to flow through each hollow tube; and

controlling the fluid in a manner to minimize temperature dependent changes in the compression forces exerted by the bolts on the stack.

5,066,883

ELECTRON-EMITTING DEVICE WITH ELECTRON-EMITTING REGION INSULATED FROM ELECTRODES

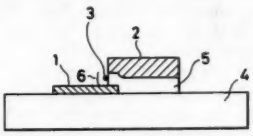
Seishiro Yoshioka, Hiratsuka; Ichiro Nomura, Yamato; Hidetoshi Suzuki, Atsugi; Toshihiko Takeda, Tokyo; Tetsuya Kaneko, Yokohama; Yoshikazu Banno, Atsugi, and Kojiro Yokono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,203

Claims priority, application Japan, Jul. 15, 1987, 62-174837; Oct. 2, 1987, 62-250448; Oct. 9, 1987, 62-255063; Oct. 9, 1987, 62-255068; Apr. 27, 1988, 63-102485; Apr. 27, 1988, 63-102486; Apr. 27, 1988, 63-102487; Apr. 27, 1988, 63-102488; Jun. 21, 1988, 63-154516

Int. Cl.[5] H01J *1/02*

U.S. Cl. 313—309 **49 Claims**



1. An electron-emitting device comprising a laminate having

an insulating layer disposed between opposing electrodes on a planar substrate, said insulating layer having an electron-emitting region spaced apart from said electrodes, wherein a first portion of said insulating layer is disposed between said opposing electrodes, wherein a second portion of said insulating layer is disposed between one of said electrodes and said planar substrate, said emitting region being disposed in said first portion of said insulating layer and wherein electrons are emitted from said electron-emitting region by applying a voltage to said electrodes.

5,066,884

ULTRASONIC MOTOR HAVING HIGH DRIVE EFFICIENCY

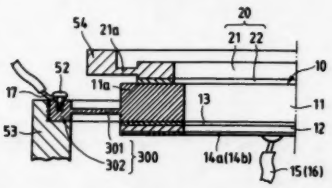
Tadao Takagi, Yokohama; Daisuke Saya, Urayasu, and Shigehisa Nemoto, Kamagaya, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 5, 1990, Ser. No. 475,000

Claims priority, application Japan, Feb. 10, 1989, 1-32085; Mar. 1, 1989, 1-50711; Sep. 16, 1989, 1-240375; Oct. 12, 1989, 1-265793; Dec. 21, 1989, 1-332299

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—323 **23 Claims**



1. An ultrasonic motor which comprises:

a stator having a piezoelectric member which is vibrated by a drive signal, and an elastic member, a junction surface of which is coupled to said piezoelectric member, and which generates a traveling vibration wave in a drive surface thereof upon vibration of said piezoelectric member;

a rotor which is urged against the drive surface of said elastic member and is driven by the generated traveling vibration wave;

a support member having a thin plate portion contiguous with an outermost peripheral surface of said elastic member, and a thick portion contiguous with an outer peripheral edge of said thin plate portion and having a larger thickness than that of said thin plate portion, said support member projecting integrally from said elastic member; and

means engaging said thick portion for fixing and supporting said support member,

wherein one end face of said thick portion is formed at the same level as the junction surface of said elastic member.

5,066,885

INDIRECTLY HEATED FILAMENTARY CATHODE

Kiyoshi Morimoto; Shigeo Itoh; Takeshi Tonegawa, and Takahiro Niiyama, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Apr. 26, 1989, Ser. No. 343,366

Claims priority, application Japan, Apr. 30, 1988, 63-108815

Int. Cl.[5] H01J *1/24*

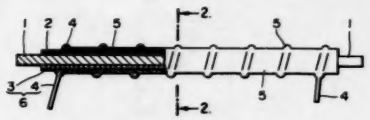
U.S. Cl. 313—340 **1 Claim**

1. An indirectly heat filamentary cathode comprising:

a heating core wire;

an electrically insulating layer for covering said heating core wire, said electrically insulating layer including a first layer formed of sintered aluminum oxide particles and a second layer formed of an intermediate film layer made of an organic material, said second layer being formed on the surface of said first layer so as to be placed on a part of said first layer;

a cathode substrate provided on said electrically insulating layer, said cathode substrate including metal conductive



layer formed of electroless plating on the surface of said second electrically insulating layer and a fine metal wire; and

an electron emitting layer provided on said cathode substrate.

5,066,886

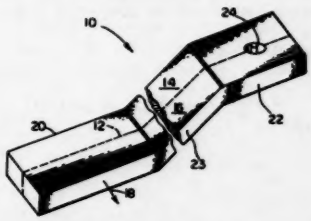
THERMALLY RESPONSIVE ARTICLE, METHOD OF MAKING SAME, AND A DEVICE INCORPORATAING SAID ARTICLE

Leslie L. Harner, Ruscombmanor Township, Berks County, and Earl L. Frantz, Reading, both of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Oct. 31, 1989, Ser. No. 429,711

Int. Cl.[5] H01J *29/80*

U.S. Cl. 313—404 **14 Claims**



1. A monometallic, thermally responsive article that provides controlled displacement corresponding to a given temperature in a predetermined temperature range, said article comprising first and second portions formed of the same material and having a first phase in said first portion characterized by a first coefficient of thermal expansion and a second phase in said second portion characterized by a second coefficient of thermal expansion, whereby said first portion has a first coefficient of thermal expansion over said temperature range and said second portion has a second coefficient of thermal expansion different from said first coefficient over said temperature range.

5,066,887

COLOR PICTURE TUBE HAVING AN INLINE ELECTRON GUN WITH AN ASTIGMATIC PREFOCUSING LENS

David A. New, Mercerville, N.J., assignor to RCA Thomson Licensing Corp., Princeton, N.J.

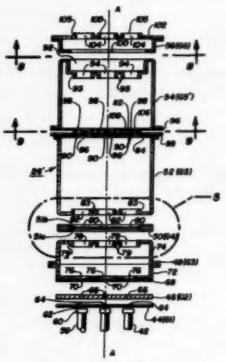
Filed Feb. 22, 1990, Ser. No. 483,487

Int. Cl.[5] H01J *29/50*

U.S. Cl. 313—414 **14 Claims**

1. In a color cathode-ray tube including an envelope having therein an inline electron gun for generating and directing three inline electron beams, including a center beam and two outer beams, along initially coplanar beam paths toward and screen on an interior portion of said envelope, said gun having six electrodes forming three electron lenses including a beam-forming lens, a prefocusing lens and a main focusing lens, the improvement wherein

said prefocusing lens includes four active surfaces, at least one of which has a recess formed therein, said active surfaces produce quadrupole fields which form an astigmatic prefocusing lens, said recess provides a preconverging action on said outer electron beams, three circular apertures being provided within said recess.



5,066,888

ALKALI METAL VAPOUR DISPENSER

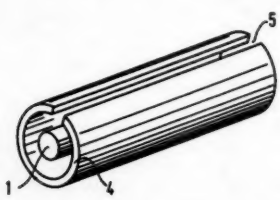
Cornelis Van Der Marel, and Arnoldus D. J. Smoorenburg, Both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1989, Ser. No. 401,887

Claims priority, application Netherlands, Sep. 2, 1988, 8802171

Int. Cl.[5] H01J *17/26;* **H01B** *1/02*

U.S. Cl. 313—564 **10 Claims**



1. A device for releasing metal vapour of an alkali metal by heating, characterized in that the device comprises a metal carrier of a metal which does not react with or hardly reacts with silicon or germanium, and up to 10% by weight of silicon or germanium, predominantly present along the grain boundaries of the carrier material, and present at least partly in the form of a silicon alkali metal compound or germanium alkali metal compound.

5,066,889

SEALED LED LAMP HOUSING

Geoffrey S. Edwards, Grange-over-Sands, England, assignor to Oxley Developments Company Limited, Cumbria, England

Filed Apr. 18, 1990, Ser. No. 510,894

Claims priority, application United Kingdom, Jul. 1, 1989, 8915167

Int. Cl.[5] H01L *23/13;* **H05B** *33/02*

U.S. Cl. 313—512 **3 Claims**

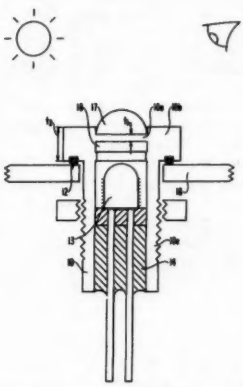
1. A sealed LED lamp housing, comprising:

(a) a unitary housing member made of a semi-transparent polymer of neutral optical density;

(b) the unitary housing member has a first, elongate, cylindrical portion defining an internal cylindrical cavity which receives the LED therewithin;

(c) the unitary housing member has a second portion forming a cylindrical lens located in front of the LED and disposed in said cylindrical cavity;

(d) the unitary housing member has a third, annular portion which is coaxial with the first portion and laterally surrounds the second portion;



(e) the third portion is of greater thickness than the second portion relative to the axial direction of the first, cylindrical portion, so as to provide a contrast annulus surrounding the second portion;

(f) the third portion is of greater diameter than the first cylindrical portion so that the third portion overlaps the first portion; and

(g) means for sealing between said overlap and an external apparatus receiving said housing.

5,066,890

PLASMA PANELS IN DELIMITED DISCHARGE ZONES

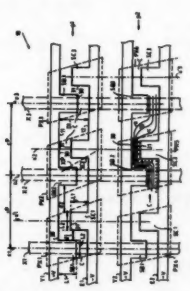
Serge Salavin, St Egreve; Jacques Deschamps, Grenoble; Michel Gay, Le Fontanil, and Michel Specty, Echirolles, all of France, assignors to Thomson Tubes Electroniques, Boulogne Billancourt, France

Filed Jun. 25, 1990, Ser. No. 542,592

Claims priority, application France, Jun. 23, 1989, 89 08386

Int. Cl.[5] H01J *17/49*

U.S. Cl. 313—585 **2 Claims**



1. A coplanar sustaining plasma panel, comprising:

addressing electrodes;

sustaining electrodes arranged in pairs and crossing said addressing electrodes, each sustaining electrode pair being formed by an addressing-sustaining electrode and a sustaining-only electrode;

a pixel formed approximately at each crossing of an addressing electrode with one of said sustaining electrode pairs, each of said electrodes of said sustaining electrode pairs comprising projecting surface, wherein said addressing electrodes cross said sustaining electrode pairs above said projecting surfaces belonging to said addressing-sustaining electrodes, and said projecting surfaces are oriented facing each other and offset relative to one another along different axes such that adjacent projecting surfaces alternately belong to an addressing-sustaining electrode and a sustaining-only electrode.

5,066,891

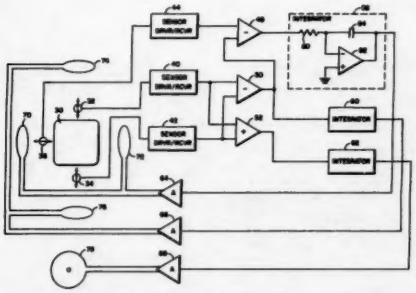
MAGNETIC FIELD CANCELLATION CIRCUIT

William J. Harrold, Derry, N.H.; Joseph A. Sansone, Rehoboth, Mass.; Joseph W. Bonfiglio, West Newton, Mass., and Seung K. Kim, Shrewsbury, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 2, 1990, Ser. No. 459,867

Int. Cl.[5] H01J *29/06*

U.S. Cl. 315—8 **20 Claims**



1. Apparatus for controlling the total magnetic field in the vicinity of a substantially plane opening of a partially open magnetic shield to a predetermined level, said magnetic shield including a flange portion defining said substantially plane opening, said apparatus comprising:

a plurality of coil means disposed on said shield, said plurality of coil means including first coil means disposed on an external surface of said flange portion adjacent said shield opening, and second coil means disposed on said shield surrounding said opening, said plurality of coil means for generating a magnetic field in the vicinity of said shield opening;

means for sensing magnetic field intensity in the vicinity of said shield opening; and

means responsive to said sensing means for applying currents selectively to said plurality of coil means and for controlling the total magnetic field in the vicinity of said shield opening to said predetermined level.

5,066,892

GLOW DISCHARGE LAMP WITH INCANDESCENT FILAMENT

Andre C. Bouchard, Peabody; Radomir Lagushenko, and Jakob Maya, both of Brookline, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Dec. 7, 1990, Ser. No. 678,571

Int. Cl.[5] H05B *41/00*

U.S. Cl. 315—46 **16 Claims**

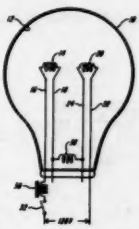
1. A glow discharge lamp comprising:

a sealed lamp envelope enclosing a noble gas and mercury;

cathode electrode means including a cathode disposed in said lamp envelope;

anode electrode means including an anode disposed in said lamp envelope; and

light-emitting means for emitting visible light for illumination substantially instantaneously upon application of power to the glow discharge lamp and for emitting little or no visible light for illumination after a glow discharge is formed between said cathode electrode means and said



anode electrode means, said light-emitting means being electrically connected such that said cathode, said light-emitting means and said anode are electrically connected in series.

5,066,893

DRIVING CIRCUIT FOR AN ELECTROLUMINESCENCE DEVICE

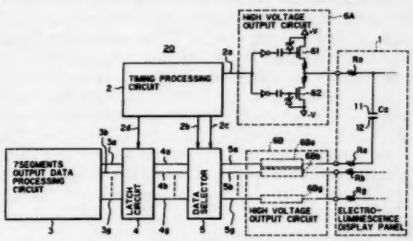
Masahiko Osada, Hekinan; Masumi Arai, and Shigeyuki Akita, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 7, 1990, Ser. No. 624,217

Claims priority, application Japan, Dec. 8, 1989, I 320308

Int. Cl.[5] G09G *3/10*

U.S. Cl. 315—169.3 **5 Claims**



1. A driving circuit for an electroluminescence device which comprises:

a plurality of driving electrodes provided on at least one electroluminescence layer;

a common electrode oppositely arranged to said driving electrodes with said electroluminescence layer interposed therebetween and commonly conducted;

a common voltage supplying means for applying a common pulse voltage to said common electrode;

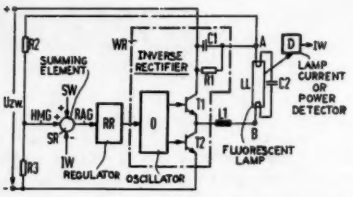
a luminescence voltage supplying means for supplying a luminescence pulse voltage having an inversed phase to and a predetermined delay time from said common pulse voltage to said driving electrodes to discharge said electroluminescence layer during said predetermined delay time and to charge the same to luminesce in the rest of the time of said luminescence pulse voltage, and

a non-luminescence voltage supplying means which operates alternately with said luminescence voltage supplying means for supplying a non-luminescence pulse voltage having approximately the same phase as that of said common pulse voltage to said driving electrodes to discharge said corresponding electroluminescence layer to extinguish.

5,066,894
ELECTRONIC BALLAST

Juergen Klier, Traunreut, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1990, Ser. No. 592,125
Claims priority, application European Pat. Off., Oct. 9, 1989, 89118713
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—224 **9 Claims**



1. An electronic ballast for a fluorescent lamp having an A.C. maintaining voltage thereacross, comprising:

a capacitor connected in parallel with the fluorescent lamp;

a lamp inductor connected in series with the fluorescent lamp;

a D.C. voltage supply including first and second poles;

an inverter rectifier including a control input, and an output connected to said series circuit of said lamp inductor and said parallel-connected fluorescent lamp and capacitor, said inverter rectifier including switch means connected to said output and connected to said first and second poles of said D.C. voltage supply;

a regulator including an error input, and an output connected to said control input of said inverter rectifier; and

error means connected to the fluorescent lamp and to said error input of said regulator and operable in response to a predetermined lamp operating parameter to compare the value of that parameter with a reference value to produce an error signal for controlling said inverter rectifier via said regulator to stabilize the brightness of the fluorescent lamp, including means for producing at least one auxiliary controlled variable value and superposing the same so that the error signal resulting from the comparison of said lamp operating parameter with said reference value only takes effect of said auxiliary controlled variable value at the lower limit of the range of brightness control of the fluorescent lamp.

5,066,895
ELECTROLUMINESCENT LAMP DRIVER

David S. Alessio, West Haven, Conn., assignor to Alrit Corporation, Prospect, Conn.

Filed Oct. 20, 1989, Ser. No. 424,403
Int. Cl.[5] H05B *37/02*
U.S. Cl. 315—226 **10 Claims**

1. Apparatus for providing electrical power to an electroluminescent lamp load comprising:

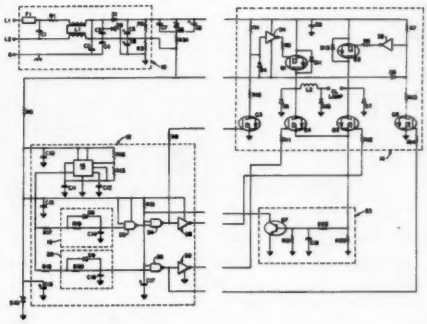
a source of direct current;

four solid state switches, said switches comprising field effect transistors, said transistors being interconnected such that each comprises one leg of a bridge circuit, said bridge circuit having four node points where pairs of said legs are connected to one another;

means connecting said current source to a pair of oppositely disposed of said node points of said bridge circuit;

means connecting the electroluminescent lamp load between the other pair of said node points of said bridge circuit, said connecting means including an inductance connected in series with the load;

logic circuit means for generating first and second command signal for said transistors, said first and second command signals each comprising a series of pulses, the pulses of said first and second command signals being non-overlapping;



means responsive to a first of said command signals for simultaneously applying gating signals to the transistors comprising a first pair of oppositely disposed legs of said bridge circuit whereby said transistors of said first pair will be simultaneously switched to the conductive state and current will flow from said source through the load and said series connected inductance in a first direction; and

means responsive to the second of said command signals for applying gating signals to the transistors comprising the second pair of oppositely disposed legs of said bridge circuit whereby current will flow from said source through the load and said series connected inductance in a second direction opposite to said first direction of current flow, the current flow in said first and second directions through said load being in synchronism with said non-overlapping command signals.

5,066,896

ELECTRIC LIGHTING AND POWER CONTROLLERS THEREFOR

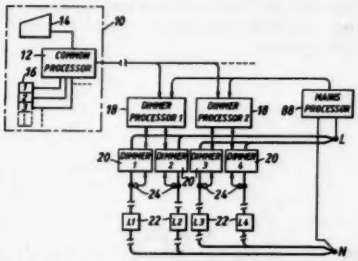
David R. Bertenshaw, Lightwater; Richard Williamson, Twickenham, both of United Kingdom, and John Wright, Sunbury, Great Britain, assignors to Strand Lighting Limited, Isleworth, United Kingdom

Filed Dec. 12, 1989, Ser. No. 450,294

Claims priority, application United Kingdom, Dec. 20, 1988, 8829717

Int. Cl.[5] H05B *39/08*

U.S. Cl. 315—291 9 Claims



1. A method of controlling power supplied from an AC supply to a lighting load by a circuit including a controllable switch, the method comprising the steps of:

measuring the supply voltage a multiplicity of times over a half-wave cycle of the supply;

producing from the measured voltages a table indicating how the switch should be operated to obtain any of a multiplicity of RMS output voltages; receiving a signal indicative of a desired RMS output voltage;

determining from the table the switch operation required for the desired RMS output voltage; and operating the controllable switch in the determined manner.

5,066,897

LINEAR DRIVING APPARATUS

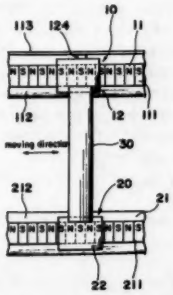
Tetuyuki Ueda, Nara, and Masayoshi Tsunezawa, Sakai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 7,356,173, May 24, 1989, abandoned. This application Feb. 5, 1991, Ser. No. 652,205

Claims priority, application Japan, May 26, 1988, 63-129982; Aug. 30, 1988, 63-217276; Nov. 30, 1988, 63-304357

Int. Cl.[5] G02K *41/02*

U.S. Cl. 318—135 9 Claims



1. A linear driving apparatus comprising:

first and second linear motors, each of which includes,

a stator having a plurality of permanent magnets, and

a movable member having polyphase windings and being freely movable through a gap on a top face of said stator;

a coupling member for mutually coupling said movable members of said first and second linear motors and being driven by said movable members through a polyphase excitation of said polyphase windings of said first and second linear motors; and

connecting means for connecting electrically the polyphase windings having a first phase of said movable member of said first linear motor with the polyphase windings having said first phase of said movable member of said second linear motor in series or in parallel, and the polyphase windings having said second phase of said movable member of said first linear motor with the polyphase windings having said second phase of said movable member of said second linear motor in series or in parallel.

5,066,898

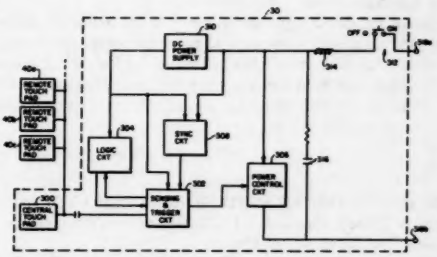
MULTI-WAY SWITCH SYSTEM HAVING PLURAL REMOTE TOUCH PADS

Ronald E. Miller, Zanesville, and Robert L. James, Cambridge, both of Ohio, assignors to Delat Systems, Incorporated, Cambridge, Ohio

Filed May 3, 1990, Ser. No. 518,464

Int. Cl.[5] H05B *37/02*

U.S. Cl. 315—362 9 Claims



1. A multi-way switch system comprising:

at least one remote switching means for generating an activation signal;

central switching means, located remotely from said remote switching means and coupled thereto by a single conducting wire, for controlling power to a load, said central switching means comprising:

means for sensing the activation signal produced by said remote switching means;

logic means responsive to said activation signal for producing a control signal;

means joined to the logic for receiving said control signal and producing a trigger signal;

means for providing a synchronization signal to synchronize said trigger signal; and

power control means responsive to the synchronized trigger signal for controlling power applied to the load, wherein the power to the load is varied in accordance with a time interval between said control signal and said synchronization signal, the power being reduced as the time interval becomes longer.

5,066,899

CONTROL METHOD OF INDUCTION MOTOR AND DEVICE THEREFOR

Masayuki Nashiki, Ooguchi, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Mar. 22, 1990, Ser. No. 497,256

Claims priority, application Japan, Mar. 24, 1989, 1-72089

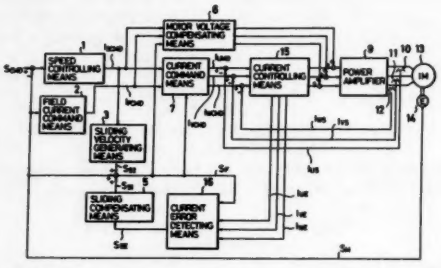
Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—807 20 Claims

1. An induction motor control device having a current control loop, said device comprising:

means for detecting a current of the induction motor and for outputting corresponding current error detection signals, said current error corresponding to a difference between said current detection signals and a current command signal of the control device;

slip compensation means for processing said current error detecting signals to obtain a slip compensation value and for outputting the slip compensation value;



slip frequency generating means for generating and outputting a slip frequency signal based on a secondary current command of the control device;

means for detecting a motor speed of the induction motor and outputting a corresponding motor speed signal; and,

means for generating a field speed signal for the induction motor, said field speed signal being generated based on a sum of said slip frequency signal, said slip compensation value and said motor speed signal.

5,066,900

DC/DC CONVERTER SWITCHING AT ZERO VOLTAGE

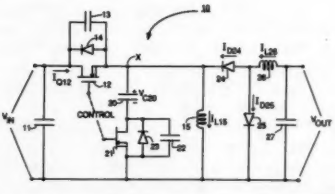
John A. Bassett, Pleasanton, Calif., assignor to Computer Products, Inc., Boca Raton, Fla.

Continuation-in-part of Ser. No. 436,394, Nov. 14, 1989, Pat. No. 4,959,764. This application Jun. 22, 1990, Ser. No. 542,478

The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.

Int. Cl.[5] H02M *3/335;* **G05F** *1/618*

U.S. Cl. 323—224 **19 Claims**



1. A DC/DC switching converter circuit comprising:

a transformer having a primary winding and a first secondary winding;

a first switching means for selectively coupling power from a power supply to the primary winding of said transformer, said first switching means including an intrinsic capacitance;

a first capacitive element having a first and a second plate, the first plate connected to the primary winding of said transformer;

a second switching means connected to the second plate of said first capacitive element and in series with said first capacitive element across the primary winding of said transformer, said second switching means including an intrinsic capacitance;

a first diode having a first terminal and a second terminal, the first terminal connected to a first terminal of the first secondary winding of said transformer;

a second diode having a first terminal and a second terminal, the first terminal connected to a second terminal of the first secondary winding of said transformer and the second terminal of said second diode connected to the second terminal of said first diode; and

an inductor having a first and a second terminal, said first terminal connected to said second diode;

wherein energy stored in the primary winding of said transformer discharges the intrinsic capacitance of said first switching means prior to turning on said first switching means, and wherein energy stored in the primary of said transformer discharges the intrinsic capacitance of said second switching means prior to turning on said second switching means.

5,066,901

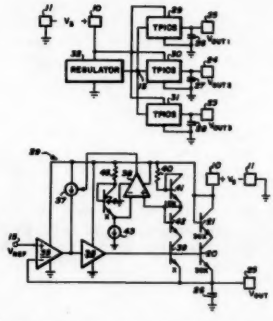
TRANSIENT PROTECTED ISOLATOR OUTPUT STAGE

Chun-Foong Cheah, Sunnyvale, and Timothy J. Skovmand, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 18, 1990, Ser. No. 584,568

Int. Cl.[5] G05F *3/30, 1/565*

U.S. Cl. 323—267 **9 Claims**



1. In a plural output voltage regulator operating from a single d-c source, wherein a single circuit provides plural regulated output voltages, and currents, which operate individually and independently from each other so as to withstand output malfunctions created by adverse load conditions such as shorting to ground or below or to a high voltage line, a plurality of transient protected isolator output stage (TPIOS) circuits, each one comprising:

an input for supplying a reference voltage to said TPIOS circuit;

an NPN output pass transistor, having emitter, base and collector electrodes, which provides one of said output voltages at its emitter;

a primary negative feedback loop which compares said output voltage with said reference voltage and drives the base of said output pass transistor whereby said output voltage is regulated; and

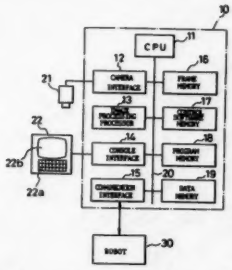
a secondary negative feedback loop which compares a fraction of said output current with a reference current and controls the base of said output pass transistor to limit said output current to a predetermined maximum value.

5,066,902

AUTOMATIC NOMINAL DATA SETTING METHOD IN A VISUAL SENSOR SYSTEM

Atsushi Watanabe, Oshimo, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP89/00661, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO90/00109, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 30, 1989, Ser. No. 465,108
Claims priority, application Japan, Jul. 1, 1988, 63-162657
Int. Cl.[5] G05B *19/18;* G06F *15/46*
U.S. Cl. 318—568.16 4 Claims



1. An automatic nominal data setting method in a visual sensor system, comprising the steps of:

(a) operating the visual sensor system to execute a program including a predetermined routine for obtaining nominal data;

(b) automatically detecting a value of a predetermined image parameter associated with the nominal data during execution of the predetermined routine while said operating is performed in step (a); and

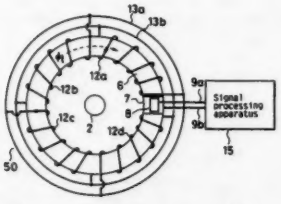
(c) automatically storing, as the nominal data, the value of the predetermined image parameter detected in step (b), by executing the predetermined routine.

5,066,903

OPTICAL CURRENT TRANSFORMER

Naoki Ochi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 608,813
Claims priority, application Japan, Dec. 14, 1989, 1-326289
Int. Cl.[5] G01R *33/032, 1/20*
U.S. Cl. 324—96 2 Claims



1. An optical current transformer comprising:

a C-letter-shaped circular iron core which has a gap part and is provided around a bus bar in which a current to be detected flows;

a magnetooptical cell which is provided in said gap part of said circular iron core for detecting a magnetic flux in said circular iron core for outputting a physically changed signal responding to intensity of said magnetic flux;

means for measuring said physically changed signal; and

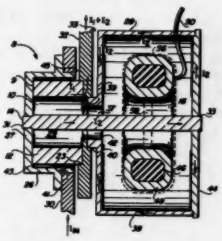
at least four windings which have the same number of turns, widths of said windings being evenly provided along the whole part of said circular iron core, and terminals of respective of said windings having the same polarity being commonly connected.

5,066,904

COAXIAL CURRENT SENSORS

Donald F. Bullock, Madbury, N.H., assignor to General Electric Company, Somersworth, N.H.

Continuation of Ser. No. 259,234, Oct. 18, 1988, abandoned.
This application Aug. 28, 1989, Ser. No. 399,344
Int. Cl.[5] G01R *1/20*
U.S. Cl. 324—127 48 Claims



1. A coaxial current sensor for providing an output signal proportional to current supplied thereto, comprising:

(a) a coaxial current divider for dividing current supplied thereto, including,

(i) a first conductor, having an aperture extending therethrough between opposite ends thereof, possessing a resistance of a value R_1,

(ii) a second conductor coaxially disposed in the aperture of said first conductor, said second conductor being connected at opposite ends thereof to corresponding opposite ends of said first conductor, and possessing a resistance of a value R_2, whereby an input current, I_{in}, supplied to one end of said first and second conductors, divides into currents I_1 and I_2 flowing in said first and second conductors respectively, and wherein the current I_2 flowing in said second conductor is given by:

$$I_2 = \frac{I_{in}}{K} \text{ where } K = \left[\frac{R2}{R1} + 1\right]; \text{ and}$$

(b) output means coaxially disposed about said second conductor and inductively coupled thereto, for sensing the current I_2 flowing in said second conductor and providing an output signal having a magnitude proportional to the magnitude of the current I_{in} supplied to said current sensor.

5,066,905

BATTERY CABLE ASSEMBLY WITH IN-LINE SWITCH

Arnold L. Betton, Reseda, and Edgar A. Hirzel, Granada Hills, both of Calif., assignors to Baton Labs, Inc., Granada Hills, Calif.

Continuation-in-part of Ser. No. 271,243, Nov. 14, 1988, abandoned. This application Oct. 24, 1989, Ser. No. 426,944
Int. Cl.[5] G01R *19/145;* H01R *13/62*
U.S. Cl. 324—133 24 Claims

23. A battery cable switch for connection to a terminal of a storage battery in circuit relation with an electrical system, to enable electrical connection and disconnection of said storage battery from said electrical system while maintaining physical connection between the battery and the electrical system, said battery cable switch comprising:

first and second battery conductors having first and second electrically conductive end caps respectively fixed thereto,

an electrically nonconductive housing having a cylindrical switch chamber extending transversely therethrough, and having first and second conductor end cap receiving ends,

said first conductive end cap being received in said first housing end, and said second conductive end cap being received in said second housing end, said end caps each having a circular surface forming a cylindrical boundary portion of said switch chamber and being mutually spaced from each other across said switch chamber,

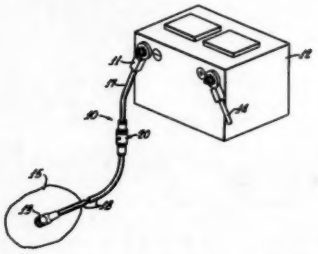
a first nonconductive housing closure fixed to said first housing end,

a first spring interposed between said first closure and said first end cap and configured to urge said first end cap inwardly of said switch chamber,

a second nonconductive housing closure fixed to said second housing end,

a second spring interposed between said second end cap and said second end closure and configured to urge said second end cap inwardly of said switch chamber,

a rotary contact member rotatably mounted in said switch chamber and having a circularly cylindrical outer surface



in sliding contact with the circular cylindrical surfaces of said first and second end caps, said rotary contact member comprising first and second longitudinally extending electrically conductive cylindrical segments and an electrical insulator interposed between said segments and secured thereto, thereby insulating said cylindrical segments from each other, said rotary contact member being rotatable within said switch chamber between a switch open position in which each of said cylindrical segments is in electrical contact with one of said end caps and is insulated from the other, and a switch closed position in which each of said cylindrical segments is in electrical contact with both of said end caps,

a lamp mounted to said housing,

means in circuit relation with said cylindrical segments and end caps for energizing said lamp from the battery only when the rotary contact member is in said switch open position, thereby providing a visual indication of said switch open position, and

a handle connected to said rotary contact member for rotating the rotary contact member between said positions.

5,066,906

TIME OF USE REGISTER FOR USE WITH A UTILITY METER

Lester C. Moore, West Lafayette, Ind., assignor to Landis & Gyr Metering, Inc., Lafayette, Ind.

Filed Sep. 22, 1989, Ser. No. 410,805

Int. Cl.[5] G01R *1/20*

U.S. Cl. 324—142 **10 Claims**

5. A register for use with an electric meter for registering electrical energy usage and adapted to be readily assembled and disassembled without the use of separate fasteners, comprising:

a circuit board having electronic circuitry for registering electrical energy usage;

a display;

an electrical conductor between said circuit board and said display for operation of said display;

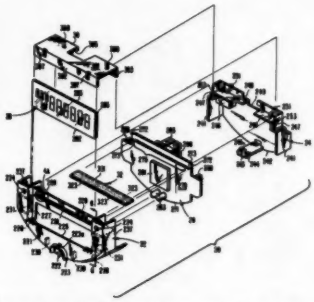
a housing including;

a front cover having means for supporting said display;

a back cover slidably interengagable with said front cover;

complementary portions on said front cover and said back cover configured to support said circuit board therebetween and to restrain said circuit board against movement within said housing; and

a resilient clamping mechanism operable to releasably clamp said front cover and said back cover together with said circuit board contained therebetween;



wherein said resilient clamping mechanism includes:

catch means between lower portions of said front cover and said back cover, said catch means including a resilient finger and notch arrangement wherein the finger is resiliently engageable within said notch;

a resilient clip adapted to span between said front cover and said back cover at top portions of both said covers; and

snap-fit means between said clip and each said top portions of said front and back covers for snapping said clip over each said top portions to clamp said front and back covers together.

5,066,907

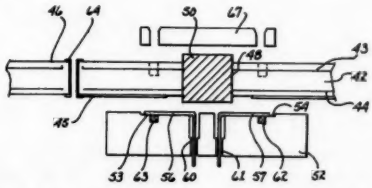
PROBE SYSTEM FOR DEVICE AND CIRCUIT TESTING

John W. Tarzwell, Scottsdale; Patrick J. Tarzwell, Mesa; Theodore R. Myers, Tempe; Barry M. Hyland, Scottsdale; John C. Dahl, Mesa, and Jack L. Eddings, Scottsdale, all of Ariz., assignors to Cerprobe Corporation, Tempe, Ariz.

Filed Feb. 6, 1990, Ser. No. 475,820

Int. Cl.[5] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **7 Claims**



1. In a probe assembly for use in testing electrical circuits, the improvement comprising:

(a) a plurality of probes, each having a bend therein to form a supported length and a depending portion, said depending portion extending downwardly from said supported length for making temporary electrical contact with a predetermined location on an electrical circuit to be tested;

(b) a probe guide for supporting said probes, said guide

having a plurality of slots each for receiving the supported length of a different one of said probes, and having a plurality of holes each aligned with a different one of said slots for receiving a depending portion of a probe supported by said one of said slots;

(c) a first elastomeric means positioned within a recess provided therefor in said probe guide for contacting the supported lengths of said probes and urging them upwardly into contact with corresponding signal traces;

(d) a pressure plate having an upper and a lower surface, said lower surface including a plurality of signal traces each corresponding to a different one of said probes and positioned over the supported length of a corresponding probe for making electrical contact therewith;

(e) means contacting a signal trace on said lower surface to conduct signals on said signal trace to the upper surface of said pressure plate; and

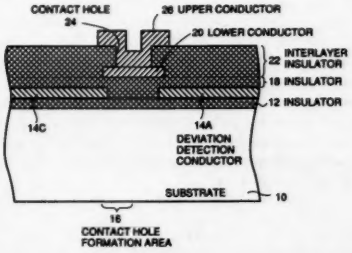
(f) second elastomeric means positioned between said pressure plate and said probe guide, contacting said probes and urging the depending portions thereof into said holes.

5,066,908

METHOD FOR ELECTRICALLY DETECTING POSITIONAL DEVIATION OF CONTACT HOLE IN SEMICONDUCTOR DEVICE

Yasushi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1990, Ser. No. 485,719
Claims priority, application Japan, Feb. 27, 1989, 1-47781
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—158 R **8 Claims**



1. A method for detecting a positional deviation of a contact hole which is formed in a semiconductor integrated circuit formed on a semiconductor substrate, said contact hole being formed in an interlayer insulator layer to mutually connect a pair of conducting layers separated from each other by the interlayer insulator layer, comprising the following steps:

forming a detection conductor pattern on a substrate at a peripheral portion of a contact hole formation area in which the contact hole is to be formed,

then forming a first insulating layer to cover said detection conductor pattern,

further forming a first conducting layer of a predetermined pattern on said first insulating layer so as to cover said contact hole formation area,

then forming a second insulating layer to cover said first conducting layer so as to form said interlayer insulator layer,

thereafter forming said contact hole at the contact hole formation area in said second insulating layer,

further forming a second conducting layer on said second insulation layer so that said second conducting layer is deposited within said contact hole to contact said first conducting layer in said contact hole, and

detecting a short-circuit between said detection conductor pattern and one of said first and second conducting layers,

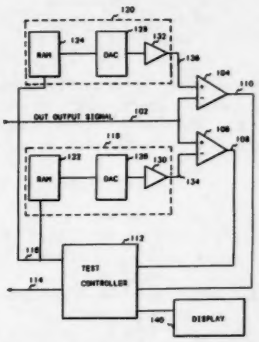
whereby, when said short-circuit is detected, it is judged that the formed contact hole adversely deviates from a position of said first conducting layer because the contact hole formed with adverse deviation from said position of said first conducting layer perforates through said first insulating layer to reach said detection conductor pattern and therefore said second conducting layer deposited within said contact hole is in short-circuit with said detection conductor pattern.

5,066,909

APPARATUS FOR TESTING AN ELECTRONIC CIRCUIT HAVING AN ARBITRARY OUTPUT WAVEFORM

Kamran Firooz, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 30, 1990, Ser. No. 472,505
Int. Cl.[5] G01R *23/16*; G06F *15/31*
U.S. Cl. 324—158 R **12 Claims**



5. A system for testing an arbitrary output waveform of a device under test, said system comprising:

first waveform generator means for creating an upper output limit waveform;

second waveform generator means for creating a lower output limit waveform;

first comparator means for comparing said device under test output waveform to said generator upper output limit waveform and for generating a first error signal when said device under test output exceeds said upper limit output;

second comparator means for comparing said device under test output to said generator lower output limit waveform and for generating a second error signal when said device under test output exceeds said lower limit output; and

controller means for stimulating said device under test and said first and second generators and for detecting said first and second error signals.

5,066,910

ROTATIONAL SPEED DETECTOR FOR AN INTERNAL COMBUSTION ENGINE COMPRISING A WAVEFORM PROCESSOR FOR ELIMINATING UNWANTED PULSES

Naoki Sugiyama, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Continuation of Ser. No. 237,409, Aug. 29, 1988, abandoned.
This application Dec. 19, 1990, Ser. No. 629,030
Claims priority, application Japan, Aug. 31, 1987, 62-215353
Int. Cl.[5] G01P *3/487*
U.S. Cl. 324—166 **12 Claims**

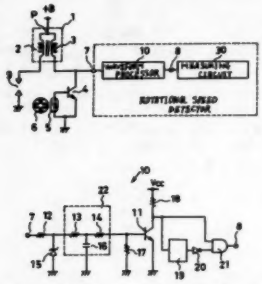
1. A rotational speed detector for an internal combustion engine comprising:

a waveform processor for processing an input ignition waveform and for eliminating unwanted pulses therefrom;

the unwanted pulses being generated within a predetermined period of time after a desired ignition signal pulse in the input ignition waveform appears;

the waveform processor particularly comprising a square

wave waveform shaper responsive to the input ignition waveform for providing a square wave output, a monostable multi-vibrator responsive to the square wave output of the waveform shaper, a logic circuit responsive to the monostable multi-vibrator and the square wave output of



the waveform shaper to provide an output signal with unwanted pulses eliminated therefrom; and

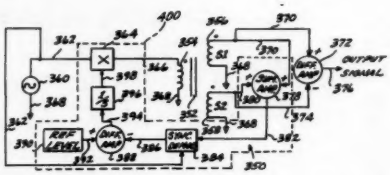
measuring means responsive to the output signal of the logic circuit of the waveform processor for measuring a rotational speed.

5,066,911

APPARATUS AND METHOD FOR SENSING DISPLACEMENT USING VARIATIONS MAGNETIC FLUX LINKAGE

Rand H. Hulsing, II., Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 7, 1989, Ser. No. 335,141
Int. Cl.[5] G01B *7/14*
U.S. Cl. 324—207.18 **30 Claims**



1. Apparatus for producing a signal indicative of displacement, comprising:

(a) an electromagnetic core, said core integrally including a primary leg and two secondary legs and having a primary pole formed on the primary leg, separated by gaps from two secondary poles that are each formed on adjacent facing surfaces of the two secondary legs;

(b) a primary coil disposed around the primary leg of the core, said primary coil being adapted to connect to a source of electric current, said electric current causing magnetic fields to be developed across the gaps that separate the primary pole from each of the secondary poles;

(c) two secondary coils, each disposed around one of the two secondary legs of the core; and

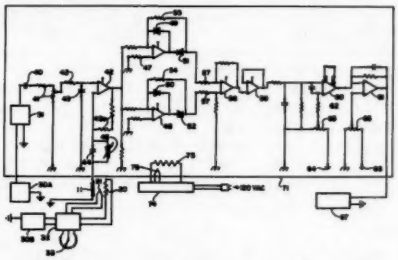
(d) two pole pieces, each disposed generally within one of the gaps, displacement of the pole pieces within said gaps varying a reluctance to magnetic flux across each gap by changing the extent to which each pole piece lies with the gap between the primary pole and one of the secondary poles, variations in the reluctance due to said displacement of the pole pieces causing an electric signal induced in each of the secondary coils by the magnetic flux flowing within the core and across the gaps to vary in a substantially linear manner.

5,066,912

CALIBRATABLE NON-CONTACT INDUCTIVE DISTANCE MEASURING DEVICE

Richard F. Kwiatkowski, 540 Pearce Mill Rd., Wexford, Pa. 15090

Filed Jul. 9, 1990, Ser. No. 549,894
Int. Cl.[5] G01R *35/00, 33/00;* **G01N** *27/72*
U.S. Cl. 324—224 **12 Claims**



1. Apparatus for measuring the distance between detecting coil and a metal object, said apparatus including:

a detecting coil enveloped in an enclosure to maintain an elevated operating temperature for the detection coil;

means for supplying a controlled air flow used in conjunction with said heater and thermocouple to maintain a desired operating temperature to said detecting coil;

an electronic circuit including an amplifier responsive to a signal by said detecting coil whereby a signal appearing at the output of said amplifier will vary as a function of the distance between said detecting coil and an adjacent metallic objection; and

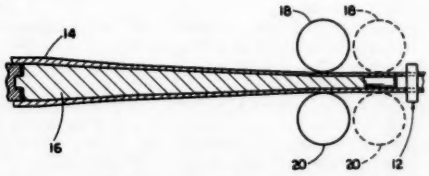
control means including an electrical heater coupled to a temperature control responsive to a signal of a thermocouple for maintaining said detecting coil at an predetermined constant operating temperature of at lest 400° F. in conjunction with said means for supplying a controlled air flow to minimize temperature variations affecting operation of said detecting coil.

5,066,913

FERROUS METAL DETECTOR FOR DETECTING A BROKEN MANDREL IN A COLD PILGERING OPERATION

John A. Catanese, Seward, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 2, 1990, Ser. No. 517,887
Int. Cl.[5] G01N *27/72;* **G01R** *33/12*
U.S. Cl. 324—226 **9 Claims**



1. In combination wit pilger tooling of cold reduction of the cross-sectional size of tubing composed of non-ferrous metal, said tooling including an elongated stationary mandrel composed of ferrous metal for supporting a length of tubing thereon in position for cold reduction and a pair of roller dies positioned along opposing sides of said mandrel and in oppositely-facing relation for coacting with said mandrel in cold reduction of the cross-sectional size of the tubing as the tubing

is moved along a predetermined path relative to said mandrel and between said dies, a ferrous metal detector, comprising:

(a) sensing means located adjacent to said roller dies and an end of said mandrel and including a primary winding and a secondary winding positioned along the path of tubing movement and sufficiently close to one another to be magnetically coupled together by a piece of said ferrous mandrel when located therebetween; and

(b) means connected to said primary winding for exciting said primary winding with a substantially constant predetermined signal being transparent to the non-ferrous metal of the tubing so as to couple a substantially constant voltage in said secondary winding unaffected by the presence of the tubing; and

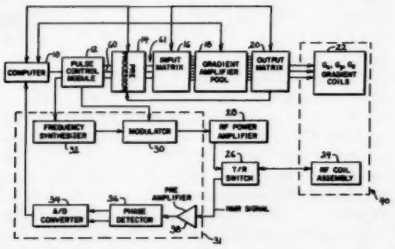
(c) means connected to said secondary winding for detecting a change in the constant voltage in said secondary winding as would be produced by an increase in magnetic coupling between said primary and secondary windings due to the presence between said windings of a piece of the mandrel composed of ferrous material.

5,066,914

GRADIENT AMPLIFIER SYSTEM WITH FLEXIBLE AMPLIFIER ALLOCATION

Robert M. Vavrek, Waukesha, and Thomas G. McFarland, Hartland, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 26, 1990, Ser. No. 498,731
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **5 Claims**



1. In an MRI apparatus including gradient coils for applying a sequence of gradient fields to an imaged object during a NMR imaging sequence, each gradient field associated with a corresponding gradient axis, a gradient amplifier system comprising:

a gradient waveform preprocessor for generating a gradient master signal for a gradient axis;

a plurality of amplifiers having inputs and outputs;

an input switch matrix for generating at least one input signal from the master signal and selectively connecting the input signal to the input of at least one amplifier to form an amplifier stack in which the amplifiers in the stack operate together in response to the gradient master signal; and

an output switch matrix for combining the outputs of the amplifiers in the stack to produce a gradient output signal for driving the gradient coil associated with the gradient axis of the master signal;

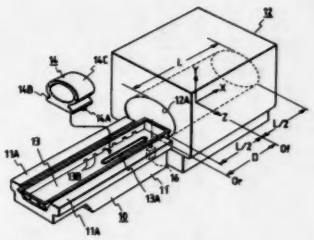
whereby the amplifiers may be selectively added or removed from the stacks by means of the input and output switch matrices.

5,066,915

RF COIL POSITIONING DEVICE FOR MRI

Katsuhisa Omori, Atsugi, and Masaya Yamashita, Hiratsuka, both of Japan, assignors to Siemens-Asahi Medical System, Ltd., Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 540,720
Claims priority, application Japan, Jun. 28, 1989, 64-167494
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—318 **18 Claims**



1. An RF coil positioning device for MRI in which a pallet movably mounted on a mount is moved by drive means so that an RF coil unit mounted on said pallet is moved from its initial positioned at an imaging position in a magnetostatic field generator, said coil positioning device comprising:

coil detecting means provided at a predetermined position along a path of said pallet, for detecting the passage of said RF coil unit through a reference position on said path and generating a detection signal, the distance between said reference position and said imaging position being preknown;

distance detecting means for detecting the distance of travel of said pallet; and

drive control means supplied with signals from said coil detecting means and said distance detecting means, for controlling said drive means to move said pallet until the distance of its travel after the generation of said detection signal becomes equal to the distance from said reference position to said imaging position;

wherein said coil detecting means is provided below the underside of said pallet.

5,066,916

TECHNIQUE FOR SEPARATING ELECTROMAGNETIC REFRACTED SIGNALS FROM REFLECTED SIGNALS IN DOWN HOLE ELECTROMAGNETIC TOOLS

Rama N. Rau, League City, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Jan. 10, 1990, Ser. No. 463,204
Int. Cl.[5] G01V *3/30*
U.S. Cl. 324—338 **12 Claims**

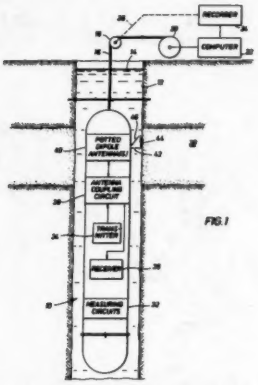
8. An apparatus for conducting a survey of formations adjacent to a well borehole the apparatus comprising:

(a) a transmitter means for forming a signal to be transmitted in the frequency range from 20 megahertz to 2.0 gigahertz;

(b) transmitter antenna means connected to said transmitter for forming a transmitted signal, said antenna means forming a signal having a known direction of circular polarization and for transmitting said signal into the borehole and surrounding earth formation;

(c) receiver antenna means longitudinally spaced from said transmitter antenna for receiving a signal returned by formations adjacent to the well borehole as a result of operation of said transmitter; and

(d) said receiver means further including means responsive to polarization of the received returned signal thereat for



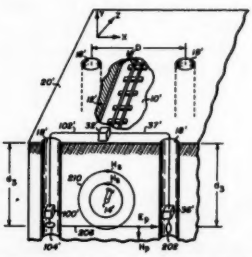
indicating the direction thereof, wherein the direction of polarization indicates reflected or refracted waves.

5,066,917

LONG FEATURE VERTICAL OR HORIZONTAL ELECTRICAL CONDUCTOR DETECTION METHODOLOGY USING PHASE COHERENT ELECTROMAGNETIC INSTRUMENTATION

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Filed Jan. 17, 1990, Ser. No. 466,494
Int. Cl.[5] G01V *3/12, 3/08, 3/30, 3/26*
U.S. Cl. 324—338 **9 Claims**



1. A method for detecting underground electrical conductors which comprises:

a. placing a transmitter having a transmitter tuned magnetic dipole antenna in a first drillhole extending into a first region suspected of containing an underground conductor, the transmitter being adapted for transmitting a primary, phase coherent continuous radio wave capable of inducing current flow in said conductor from said transmitter tuned magnetic dipole antenna;

b. placing a receiver capable of receiving a scattered wave generated by said current flow in said conductor in a second drillhole extending into a second region suspected of containing said underground conductor, the receiver having a receiver tuned loop magnetic dipole antenna oriented to receive said scattered wave and to discriminate against reception of said primary phase coherent continuous radio wave,

c. transmitting said primary phase coherent radio wave from said transmitter through said tuned magnetic dipole antenna into said first region; and

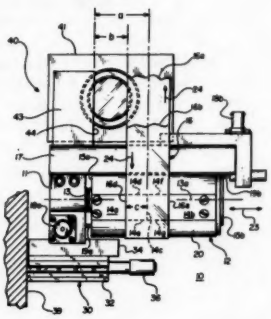
d. receiving said scattered wave at said receiver tuned loop magnetic dipole antenna as a received signal.

5,066,918

APPARATUS AND METHOD FOR MEASURING LATERAL CHARGE DISTRIBUTION ON A MOVING WEB

Robert J. Pazda, Waterloo; Kenneth L. Clum, Webster, and Harrison P. Hood, III, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 14, 1990, Ser. No. 627,174
Int. Cl.[5] G01N *27/61;* **G03G** *15/00*
U.S. Cl. 324—452 **5 Claims**



1. Apparatus for measuring lateral charge distribution on an elongated moving web comprising:

a cylindrical roller rotatable about a central axis of rotation, the outer surface of the roller including a plurality of closely adjacent charge measurement segments electrically isolated from each other along a line of separation therebetween, the measurement segments being oriented end-to-end, at the line of separation, in a direction parallel with the axis of rotation of the roller, the measurement segments being adapted during rotation of the roller to periodically engage the moving web in an area of surface contact between the web and at least one of the measurement segments during conveyance of the moving web across a portion of the circumference of the roller;

means for translating the roller in a direction perpendicular to the direction of travel of the web so as to move the line of separation between the segments laterally across the web thereby varying the relative areas of surface contact of each segment with the web;

dimensional measurement means for periodically measuring the lateral dimension of the area of surface contact between the web and one of the segments as the roller translates laterally across the web;

and means coupled to both segments adapted for periodic measurement of the charge separately on each segment in the respective area of surface contact between each segment and the web, whereby lateral integral charge distribution on the web can be determined as a function of the web contact surface area of one segment to the total web contact surface area of both segments.

5,066,919

FAULT DETECTION AND ISOLATION IN AUTOMOTIVE WIRING HARNESS BY NETWORK ANALYSIS METHOD

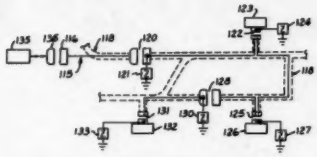
David J. Klassen, Dearborn, and Edward G. Anderson, Bloomfield Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1990, Ser. No. 504,458
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—538 **9 Claims**

1. An automotive electrical system comprising:

a plurality of electrical components including at least one termination device;

a wiring harness system interconnecting said electrical components and including a plurality of harness conductors and a plurality of connectors, at least one of said connectors being a termination connector connected to a termination device, said wiring harness system including a dedicated test line provided by a termination conductor disposed in said termination connector and provided by more than one of said harness conductors, said dedicated test line including a test point, selected ones of said connectors including an impedance, each impedance coupling



said dedicated test line in each respective connector to a predetermined electrical potential;

electrical source means connected to said test point for applying a test signal to said dedicated test line at said test point; and

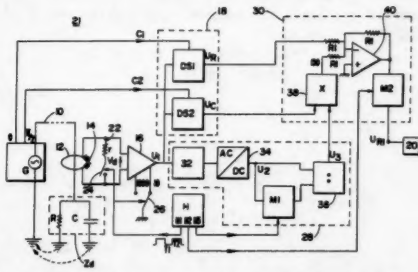
measuring means connected to said test point for sensing a response of said dedicated test line during application of said test signal, whereby an electrical characteristic of said response identifies a connector fault in said wiring harness system.

5,066,920

CORRECTION PROCEDURE OF THE PHASE DIFFERENCE INTRODUCED BY A ZERO SEQUENCE TOROID OF LEAKAGE CURRENT AND ISOLATION MONITOR THIS PROCEDURE

Eric Suptitz, Grenoble, France, assignor to Merlin Gerin, France

Filed May 22, 1990, Ser. No. 526,909
Claims priority, application France, May 22, 1989, 89 06769
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—544 **14 Claims**



1. A procedure for measuring a phase difference introduced by a toroid in a system for monitoring an earth leakage current indicative of isolation in an electrical power system having at least one conductor, said procedure comprising the steps of:

continuously injecting an AC reference signal having a frequency less than that of said power system on to said at least one conductor in such a manner that said signal is injected between said conductor and a ground;

disposing a differential transformer including a zero sequence toroid around said conductor and connecting a switchably engaged load across the terminals of said toroid and in parallel therewith;

measuring with said differential transformer a signal propagating through said conductor which is indicative of a leakage current propagating through a ground fault of said conductor;

said measuring step further including the steps of measuring at least an amplitude of a no-load voltage across said terminals, when said load is not engaged, and measuring an amplitude of a load voltage across said terminals at a second frequency, when said load is engaged;

obtaining a predetermined ratio assimilated to the tangent of the angle of phase difference by dividing said load voltage amplitude by said no-load voltage amplitude;

analyzing a phase and magnitude of said measured signal to discriminate between and to obtain resistive and capacitive components thereof; and

mathematically combining said ratio and said resistive and capacitive components to obtain an essentially true measure of said phase difference introduced by said toroid.

5,066,921

RADOME DIAGNOSTIC SYSTEM

Eugene L. Rope, El Cajon; Dary R. Stewart, San Diego; Gus P. Tricoles, San Diego; Gary L. Vance, San Diego; Jonathan Roussos, San Diego, and Roy S. Luoma, Fallbrook, all of Calif., assignors to General Dynamics, Electronics Division, San Diego, Calif.

Filed Aug. 1, 1990, Ser. No. 561,318
Int. Cl.[5] G01R *27/000*; H01Q *1/420*
U.S. Cl. 324—639 **11 Claims**

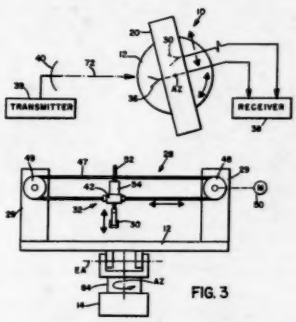


FIG. 3

1. A radome diagnostic system, comprising:

a turntable;

mounting means for rotatably mounting the turntable horizontally for rotation about a central, vertical axis;

support means on the turntable for mounting a radome in a radome support area extending across the turntable;

transmitter means remote from the turntable for directing radiation towards the radome support area on the turntable;

a scanning assembly mounted on the turntable including a probe antenna for receiving radiation transmitted from said transmitter means through said radome, and scanning means for mounting the probe antenna for movement along a series of parallel scanning paths over a scanning plane in the radome support area;

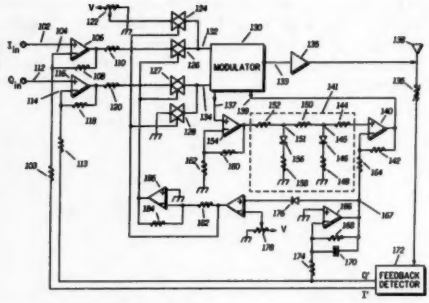
a reference antenna at a fixed position on the turntable for receiving radiation transmitted from the transmitter means to provide a reference signal, said radiation received by said reference antenna being unperturbed by said radome mounted in said radome support area; and

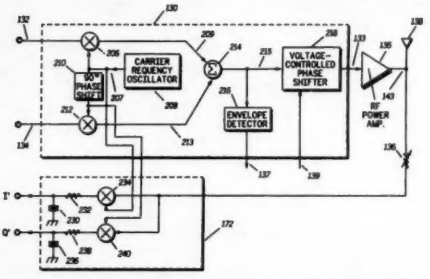
receiver means connected to the probe antenna and reference antenna for sampling the phase and amplitude of radiation received by said probe antenna relative to said reference signal.

5,066,922
STABILIZING CIRCUIT FOR FEEDBACK RF AMPLIFIER

Clifford D. Leitch, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 422,267, Oct. 16, 1989, abandoned.
This application Apr. 18, 1991, Ser. No. 686,852
Int. Cl.[5] H03F *1/26*
U.S. Cl. 330—51 12 Claims





1. A linear amplifier for receiving an input signal and producing an output signal, comprising:

a feedback loop for providing a feedback signal;

feedforward phase correction means comprising a nonlinear network with a characteristic selected to approximately cancel the AM to PM conversion characteristic of the linear amplifier;

feedback phase correction means comprising phase detection means for detecting a difference between the phase of the feedback signal and the phase of the input signal; and,

a voltage-controlled phase shifter for correcting slowly-varying phase effects.

3. A linear amplifier, with a feedback loop, for receiving an input signal and producing an output signal, comprising:

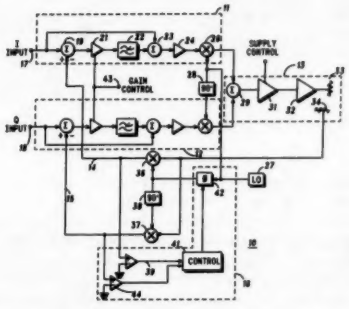
detection means for detecting oscillation in the linear amplifier; and

a soft start circuit to force the open loop gain of the feedback loop to be less than one for a period of time beginning at startup, to prevent oscillation from occurring before a normal phase relationship has been established in the linear amplifier.

5,066,923
LINEAR TRANSMITTER TRAINING METHOD AND APPARATUS

Paul H. Gailus, Prospect Heights; Francis R. Yester, Arlington Heights, and William J. Turney, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1990, Ser. No. 606,653
Int. Cl.[5] H03F *1/36*
U.S. Cl. 330—107 16 Claims



1. A method of maintaining linear operation of a negative feedback amplifier, comprising the steps of:

A) during a first mode of operation:

i) phase adjusting a feedback signal with respect to an input signal to provide a phase adjustment setting; and

ii) determining a clip level for the amplifier;

B) during a normal mode of operation:

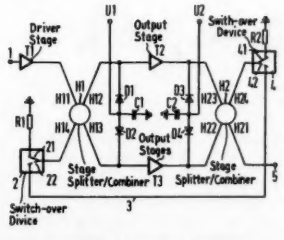
i) using the phase adjustment setting to assist in ensuring negative feedback operation; and

ii) operating the amplifier at a power level not exceeding the clip level.

5,066,924
PULSE POWER AMPLIFIER

Peter Wendt, Augsburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany and Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 25, 1991, Ser. No. 659,889
Int. Cl.[5] H03F *3/68*
U.S. Cl. 330—124 R 3 Claims



1. A pulse power amplifier comprising:

a driver stage including an input for receiving a pulse to be amplified, and an output; first and second output stages each including an input and an output;

a first splitter/combiner stage including an input, a first output connected to said input of said first output stage, a second output connected to said input of said second output stage, and a third output;

a first switch-over device operable to first and second switch conditions and including a first terminal connected to said third output of said first splitter/combiner stage, a second

terminal, a first terminating impedance connected to said second terminal, and a third terminal;

a second splitter/combiner stage including a first input connected to said output of said first output stage, a second input connected to said output of said second output stage, a first output serving as an output for said pulse power amplifier, and a second output;

a second switch-over device operable to first and second switch conditions and including a first terminal connected to said second output of said second splitter/combiner stage, a second terminal, a second terminating impedance connected to said second terminal, and a third terminal connected to said third terminal of said first switch-over device; and

control means including first and second control inputs for receiving control signals and control switches connected to said control inputs and to said inputs and outputs of said output stages,

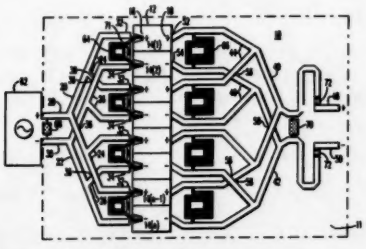
said pulse power amplifier operable with maximum signal gain and in response to first control signals on said control inputs such that said first and second switch-over devices are in their first switch conditions and in which said first and second terminals thereof are connected and said control switches provide a high-impedance with respect to a predetermined impedance at said inputs and outputs of said output stages so as to provide a maximum output power at said first output of said second switching device, and with a minimum signal gain and in response to second control signals at said control inputs such that said first and second switch-over devices are in their second switch conditions in which said first and third terminals thereof are connected and said control switches provide a low high-frequency impedance with respect to said predetermined impedance at said inputs and outputs of said output stages so as to provide a reflection of the power output of said driver stage and feeding of the same via said first splitter/combiner stage, said first and second switch-over devices and said second splitter/combiner stage, for reflection at said output of said output stages and via said second splitter/combiner stage to said output of said power amplifier.

5,066,925

MULTI PUSH-PULL MMIC POWER AMPLIFIER

Ronald G. Freitag, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 10, 1990, Ser. No. 625,398
Int. Cl.[5] H03F *3/26*
U.S. Cl. 330—269 **16 Claims**



1. A composite MMIC amplifier comprising:

a plurality of active devices arranged in antiphase pairs on a substrate and having inputs and outputs; and

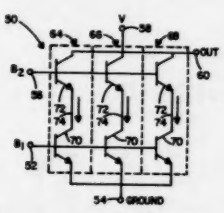
a pair of input and output transmission lines respectively coupled in antiphase arrangement to corresponding inputs and outputs of the antiphase pairs of active devices forming a virtual ground therebetween, the input and output transmission lines each include common and branched portions, the branched portions extending between the common portion to which the branched portions are connected and one active device for each branched portion, the branched portions of the input transmission lines crossover and are coupled to the inputs of alternate active devices and the branched portions of the output transmission lines crossover and are coupled to the output terminals of the alternate active devices.

5,066,926

SEGMENTED CASCODE HBT FOR MICROWAVE-FREQUENCY POWER AMPLIFIERS

Ravi Ramachandran, San Jose, and Allen F. Podell, Palo Alto, both of Calif., assignors to Pacific Monolithics, Sunnyvale, Calif.

Filed Jun. 26, 1990, Ser. No. 588,766
Int. Cl.[5] H03F *3/04*
U.S. Cl. 330—311 **2 Claims**



1. A segmented cascode transistor for microwave-frequency power amplifiers for producing an amplified output signal from an input signal, comprising:

an input terminal for receiving the input signal;

an output terminal for outputting the output signal;

a base terminal connectable to ground;

an emitter terminal connectable to ground;

a predetermined plurality of common-base heterojunction bipolar transistor means (HBTs), each common-base HBT having a base coupled to a base terminal, and a collector coupled to the output terminal; and

the predetermined plurality of common-emitter HBTs, each common-emitter HBT being associated with one of the common-base HBTs, and having a base coupled to the input terminal, an emitter coupled to the emitter terminal, and a collector coupled to only the emitter of the associated common-base HBT;

whereby current flowing in each common-base HBT is the same as the current flowing in each associated common-emitter HBT.

5,066,927

DUAL MODULUS COUNTER FOR USE IN A PHASE LOCKED LOOP

Paul Dent, Stehag, Sweden, assignor to Ericsson GE Mobile Communication Holding, Inc., Paramus, N.J.

Filed Sep. 6, 1990, Ser. No. 578,259
Int. Cl.[5] H03K *21/00, 7/18*
U.S. Cl. 331—1 A **14 Claims**

1. A variable ratio frequency divider circuit comprising:

programmable dividing means, having division ratios R1 and R2, for dividing an input signal into a divided output signal;

counting means, having a relatively long word length, responsive to a predetermined value N1 and the divided output signal of the programmable dividing means, for generating a plurality of outputs including a predetermined intermediate output;

first comparing means, having a relatively short word length, for comparing the output of said counting means to a second predetermined value N2 and for generating an output when the output of said counting means corresponds to the value N2; and

logic means, responsive to said counting means and said

comparing means, for generating selection signals for the programmable dividing means such that the programmable dividing means divides the input signal by the ratio R1, N1 times and by the ratio R2, N2 times.

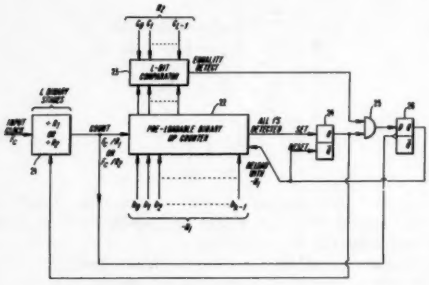
11. A phase locked loop comprising:

a voltage controlled oscillator for generating an output;

variable dividing means for dividing the output of said voltage controlled oscillator, said variable dividing means including;

programmable dividing means having division ratios R1 and R2, for dividing an input signal into a divided output signal;

counting means, responsive to a predetermined value N1 having a relatively logic word length and the divided output signal of the programmable dividing means, for generating an output including a predetermined intermediate output;



comparing means for comparing the output of said counting means to a second predetermined value N2 having a relatively short word length and for generating an output when the output of said counting means corresponds to the value N2; and

logic means, responsive to said counting means and said comparing means, for generating selection signals for the programmable dividing means such that the programmable dividing means divides the clock signal by the ratio R1, N1 times and by the ratio R2, N2 times; and

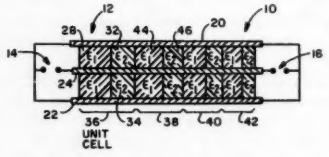
phase comparison means for comparing the divided output signal of said variable dividing means to a reference signal to generating a phase error signal which si supplied to said voltage controlled oscillator.

5,066,928

SOLITON PULSE COMPRESSOR

Hiroyuki Ikezi, Rancho Santa Fe; Yuh-Ren Lin-Liu, San Diego, and John S. deGrassie, Encinitas, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed May 2, 1990, Ser. No. 517,941
Int. Cl.[5] H03K *5/04*
U.S. Cl. 333—20 **20 Claims**



1. A pulse compressor for soliton pulses, comprising:

a continuous double-ended body;

input terminals at one end of said body for receiving a soliton pulse having a preselected width;

output terminals at the other end of said body at which the soliton pulse is produced with a reduced temporal width;

said body defining a path between said input and said output terminals for the non-linear coupling of said soliton pulse therebetween, said path having at least one of non-linear field-dependent permittivity and permeability along its length, and for selectively dispersing a portion of said pulse therealong so as to steepen the wavefront of said soliton pulse with an amplitude dependent speed as the pulse travels between said input and said output ends;

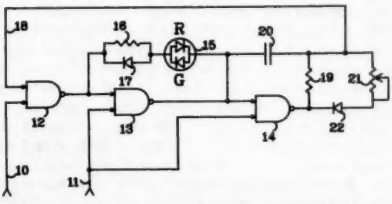
said path having a progressively reduced, spatially reduced time constant, so as to compress the soliton pulse travelling between said input and said output terminals so as to progressively compress the time length of the soliton pulse in a manner to produce a temporally compressed soliton pulse at said output terminal.

5,066,929

CIRCUIT FOR PRODUCING FOUR INDICATIONS ON A BICOLOR LIGHT EMITTING DIODE HAVING TWO LEADS

Keith R. Frantz, 6 Bungalow St., Richland, Pa. 17087

Filed Jan. 2, 1991, Ser. No. 636,669
Int. Cl.[5] H03K *3/03;* **G08B** *5/36*
U.S. Cl. 331—57 **4 Claims**



1. A circuit for producing four indications on a bicolor light emitting diode having two leads comprising:

a plurality of inversion means connected in cascade to form an oscillator, having one or more additional inputs capable of forcing the output to a given state regardless of the state of the other inputs, the light emitting diode being connected between outputs of two said inversion means;

a current modifying means for reducing the amplitude of the current in one direction through said light emitting diode relative to the current in the other direction; and

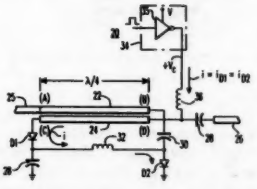
a duty cycle adjustment means for controlling the relative durations of the current flow through said light emitting diode in one direction relative to the other.

5,066,930

HIGH EFFICIENCY DIODE PHASE SHIFTER

Alfred W. Morse, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1990, Ser. No. 600,650
Int. Cl.[5] H01P *1/185*
U.S. Cl. 333—164 **17 Claims**



1. A diode phase shifter comprising a four port microwave coupler formed of a pair of RF coupled first and second transmission lines, said coupler having an input port and a first

tunable port on the first transmission line and an output port and a second tunable port on a second transmission line;

first and second serially interconnected gateable diode means, the first diode means being coupled to the first tunable port and the second diode means being coupled to the second tunable port, said diode means for shunting the first and second tunable ports when forward biased and for opening the first and second tunable ports when reverse biased; and

RF coupling means in series with each of the tunable ports and each of the first and second diode means for providing an RF path to ground for each diode means and for isolating the path from DC current.

5,066,931

FILTER CONNECTOR WITH LATCHABLE MOUNTING FRAME

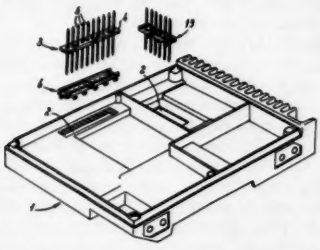
Guillaume Francois G. Thelissen, RG 'S-Hertogenbosch, Netherlands, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 18, 1990, Ser. No. 584,162

Claims priority, application Netherlands, Sep. 29, 1989, 8902429

Int. Cl.[5] H01R *13/658*

U.S. Cl. 333—182 **5 Claims**



1. A filter connector adapted to releasably latch in a metal chassis of an electrical apparatus comprising

a filter unit formed of a flat substrate of electrically insulating material having a plurality of filter capacitor elements formed on at least one side thereof, a plurality of contact elements extending through apertures in said substrate aligned with said filter capacitor elements, each of said contact elements being in electrical contact with one of said filter capacitor elements, a common ground electrode formed along at least one of peripheral lateral side edges of said substrate, and

a mounting frame of electrically conducting material having a flat base with a plurality of apertures therein corresponding to said contact elements, said filter unit being secured to said mounting frame so that a bottom surface of said flat substrate rests adjacent a top surface of said flat base and the contact elements extending from said bottom surface of said flat substrate pass through said respective corresponding apertures in the flat base, said common ground electrode being in electrical contact with said mounting frame, a plurality of resilient mounting lips formed integrally with said flat base, each said mounting lip extending away from a bottom surface of the flat base at an angle so as to extend beyond the planes of one or the other of the respective lateral peripheral sides of the flat base,

whereby when the filter connector is inserted through an aperture in the metal chassis, said mounting lips are resiliently flexed inward toward said planes of said lateral peripheral side of the substrate until fully inserted into the chassis aperture when said mounting lips return to their initial position to releasably latch and electrically connect said filter connector to said metal chassis.

5,066,932

HELICAL FILTER

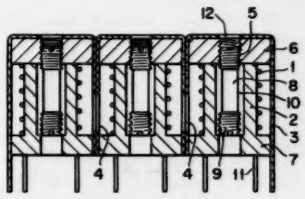
Noboru Takada, and Masami Osawa, both of Tsurugashima, Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1990, Ser. No. 570,783

Claims priority, application Japan, Aug. 30, 1989, 1-223979

Int. Cl.[5] H01P *1/20*

U.S. Cl. 333—202 **6 Claims**



1. A helical filter, comprising:

a plurality of elongated bobbins oriented substantially parallel to one another and each having respective first and second end portions, at least one of said bobbins having a hollow interior region;

a plurality of coupled helical coils, each of said coils being wound on one of said bobbins respectively, each of said coils having an open end at a first end thereof and a grounded end at a second end thereof;

a member for adjusting the resonance frequency of said filter, said member being provided at the first end portion of at least one of said bobbins so as to be adjustably movable relative to said one of said bobbins to adjust said resonance frequency; and

a screw provided in said hollow interior region of said at least on of said bobbins, said screw being accessible from the second end portion of said at least one of said bobbins having said hollow interior region to be rotatable to adjust the bandwidth of said filter.

5,066,933

BAND-PASS FILTER

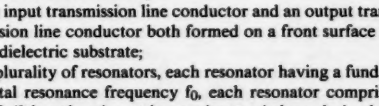
Yasuhiko Komeda, Tokyo, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Filed Aug. 7, 1990, Ser. No. 564,373

Claims priority, application Japan, Aug. 30, 1989, 1-223759

Int. Cl.[5] H01P *1/203*

U.S. Cl. 333—204 **5 Claims**



1. A band-pass filter comprising:

a dielectric substrate;

a grounded conductor layer formed on a back surface of the dielectric subsrtrate;

an input transmission line conductor and an output transmission line conductor both formed on a front surface of the dielectric substrate;

a plurality of resonators, each resonator having a fundamental resonance frequency f_0, each resonator comprising a $\lambda/2$-length microstrip conductor (where λ is the line wavelength correspond to the fundamental resonance frequency, f_0) formed on the front surface of the dielectric substrate between the input and output transmission line conductors such that an adjacent pair of the plurality of microstrip conductors align in parallel over a predeter-

mined length which is equal to or less than the $\lambda/4$ length; and

a through hole formed through each of the plurality of microstrip conductors, the dielectric substrate and the grounded conductor layer at a center of the microstrip conductor, the through hole having a conductive layer formed on a wall of the dielectric substrate and electrically connecting the microstrip conductor and the grounded conductor layer;

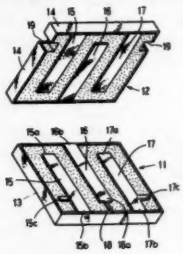
wherein the band-pass filter is rendered in a resonance condition only at the fundamental resonance frequency f_0.

5,066,934

METHOD OF ADJUSTING A FREQUENCY RESPONSE IN A STRIPLINE FILTER DEVICE

Kenji Ito; Hiroyuki Shimizu, and Naomasa Wakita, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jan. 10, 1991, Ser. No. 639,352
Claims priority, application Japan, Jan. 12, 1990, 2-5552
Int. Cl.[5] H01P *1/203*
U.S. Cl. 333—205 **6 Claims**



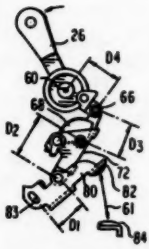
1. A method of adjusting a frequency response of a stripline filter device which comprises a pair of dielectric substrates each having a peripheral and outer surfaces provided with an external ground conducting layer, and a plurality of stripline resonator conducting layers sandwiched between the dielectric substrates, each resonator conducting layer having a short circuit end connected to the ground conducting layer on one lateral surface of each substrate and an open circuit end spaced from the ground conducting layer on the opposite lateral surface of each substrate, wherein the method comprises the steps of electrically connecting the open circuit end of one or more specific resonator conducting layers to the external ground conducting layer on the peripheral surface of each substrate by means of a fine strip member, assembling the dielectric substrates with the resonator conducting layers therebetween, adjusting the frequency response characteristics of the resonator conducting layers provided with no fine strip member at the open circuit ends thereof, and then adjusting sequentially the frequency response characteristics of the resonator conducting layers each provided with the fine strip member by disconnecting the associated fine strip member so as to separate the open circuit ends from the external ground conducting layer.

5,066,935

CIRCUIT BREAKER

George S. Harper, Cambridge, Md., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 362,258, Jun. 6, 1989, abandoned, which is a division of Ser. No. 189,790, May 3, 1988, abandoned, which is a division of Ser. No. 848,169, May 22, 1986, abandoned, which is a division of Ser. No. 486,716, Apr. 20, 1983, abandoned. This application Feb. 5, 1991, Ser. No. 651,115
Int. Cl.[5] H01H *9/00*
U.S. Cl. 335—172 **15 Claims**



1. A circuit breaker which exhibits a contacts-open and a contacts-closed position, comprising:

a first electrical contact which includes a center;

a contact arm bearing a second electrical contact which also includes a center, said contact arm being mounted for pivotal movement about a first pivot axis which is spaced from the center of said second electrical contact by a distance L, the pivotal movement of said contact arm about said first pivot axis in first and second directions serving to bring said second electrical contact into and out of electrical contact with said first electrical contact, the centers of said electrical contacts, in the contacts-open position of said circuit breaker, being spaced apart a distance G;

a toggle mechanism including first and second toggle link members, said first toggle link member being pivotably connected to said contact arm for pivotal movement about a second pivot axis, said first and second pivot axes being spaced apart a distance D_1, and said second toggle link member being pivotably connected to said first toggle link member for pivotal movement about a third pivot axis, said second and third pivot axes being spaced apart a distance D_2;

a handle, pivotably connected to said second toggle link member for pivotal movement about a fourth pivot axis, said third and fourth pivot axes being spaced apart a distance D_3;

a frame including a main body portion and first and second arms extending outwardly from said main body portion, said first arm including handle mounting means for mounting said handle for pivotal movement about a fifth pivot axis, said fourth and fifth pivot axes being spaced apart a distance D_4, and said second arm including contact arm mounting means for mounting said contact arm for pivotal movement about said first pivot axis;

wherein said handle mounting means and said contact arm mounting means have pivot centers which together define the end points of the hypotenuse of a right triangle, the sides of which have dimensions D_5 and D_6;

wherein the pivot center of said contact arm mounting means is spaced from a plane parallel to the side of said right triangle of dimension D_5 by a distance D_7, said plane intersecting said main body portion; and

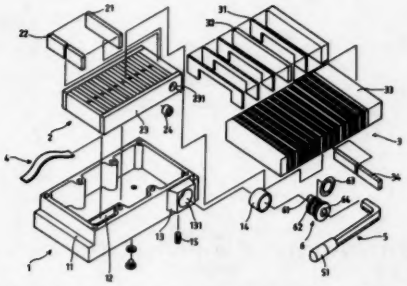
wherein D_1, D_2, D_3, D_4, D_5, D_6 and D_7 are chosen so that the ratio G/L is greater than 0.60.

5,066,936

STRUCTURE OF PERMANENT MAGNETIC WORK HOLDER

P. J. Hsu, No. 5, Alley 1, Lane 250, Min Chuan East Road, Taipei, Taiwan

Filed Feb. 21, 1991, Ser. No. 658,618
Int. Cl.[5] H01F *7/04, 7/20;* B25B *11/00*
U.S. Cl. 335—295 1 Claim



1. A new structure of permanent magnetic work holder comprising first and second sleeves, a base, a magnet conductive disk, a work holder, a support plate spring, an operating lever and a cam, in which the base is a light-weight aluminum alloy having two pads mounted on the bottom thereof, shoulder portions at each lateral side, a plate spring receiver at the bottom thereof, a block mounted thereon with a hole therein for receiving a first sleeve, at the front edge, and a set screw for securing the sleeve in the block; said magnetic conductive disk being composed of magnet conductive plate and magnet separated from each other and a tin plate having a guide hole for holding of a second sleeve and mounting said conductive plate and magnet; the holder being composed of a copper plate and a magnetic conductive plate which are separated from each other and a magnet, and a board mounting said plates at each side thereof, the copper plate being U-shaped and receiving the magnet between the legs thereof; the support plate spring being a plate spring received in said base; and the operating lever being L-shaped with cylindrical handle at the front end; the cam having an eccentric shaft, a circular groove to hold an O-ring, and a hexagonal socket on the end face; and characterized by the application of fusion weld at high temperature for assembly of the magnetic conductive disk and the holder, in which the support plate spring is first placed in the plate spring receiver in the base, the magnetic conductive disk, the eccentric shaft of the cam is turned and inserted into a second sleeve received in the guide hold in the magnetic conductive disk and tin plate, and the holder is mounted on the base, the pads on the base being made of aluminum alloy to facilitate use of the electromagnetic holder; and the first sleeve extending through the hole in the block on said base for holding the cam which in turn receives an end of the operating lever to eliminate the possibility of it being seized.

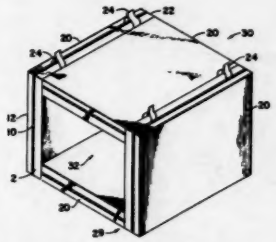
5,066,937

SEARCH COIL ASSEMBLY WITH LAMINATE FRAME MEMBERS AND METHOD FOR MAKING SAME

James M. Moran, Leominster, Mass., assignor to Barkley & Dexter Laboratories, Fitchburg, Mass.

Filed Jun. 24, 1990, Ser. No. 557,626
Int. Cl.[5] H01F *15/04, 27/28*
U.S. Cl. 336—84 C 1 Claim

1. A metal detector search coil assembly comprising a frame assembly having an aperture therethrough, electrically conductive strands wound upon said frame assembly, potting plastic disposed on external surfaces of said frame assembly and embedding said strands, and a metal housing enclosing said potting plastic, said frame assembly comprising four frame members joined together to form said aperture, each of said frame members comprising a first sheet of rigid plastic, a second sheet of rigid plastic of substantially the same configuration and substantially the same size as said first sheet, an electrically conductive material disposed between said first and second rigid plastic sheets, said conductive material being spaced from peripheral edges of said sheets, and adhesive disposed on margins of said sheets between said peripheral edges and said conductive material and including pockets of adhesive surrounded by said conductive material, to bond said sheets together with said conductive material bonded therebetween, and means for interconnecting each of said frame members conductive material with at least one other frame member conductive material, said interconnecting means comprising metallic foil strips and being operative at three corners of said frame assembly for interconnecting said conductive materials of two adjoining frame members, two metallic foil strips on one frame member being joined to two metallic foil strips on each of said adjoining frame members.

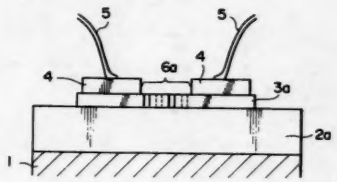


5,066,938

DIAMOND FILM THERMISTOR

Koji Kobashi, Nishinomiya, Japan; Koichi Miyata, Raleigh, N.C.; Kazuo Kumagai; Takayoshi Inoue, both of Kobe, Japan; Hiroyuki Tachibana, Tsukuba, Japan, and Akimitsu Nakaue, Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 11, 1990, Ser. No. 596,068
Claims priority, application Japan, Oct. 16, 1989, 1-270085
Int. Cl.[5] H01C *7/10*
U.S. Cl. 338—22 SD 2 Claims



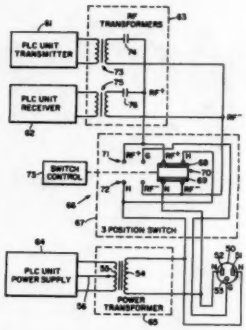
1. A diamond thin film thermistor comprising:
a substrate;
an electrically insulating diamond layer formed on the substrate by vapor-phase synthesis;
a semiconducting diamond layer formed by vapor-phase synthesis as a temperature-sensing part on the electrically insulating diamond layer; and
metal thin film electrodes attached to the semiconducting diamond layer.

5,066,939

METHOD AND MEANS OF OPERATING A POWER LINE CARRIER COMMUNICATION SYSTEM

Amos R. Mansfield, Jr., 4080 Devonshire Dr., Provo, Utah 84604

Filed Oct. 4, 1989, Ser. No. 416,852
Int. Cl.[5] H04M *11/04*
U.S. Cl. 340—310 R 33 Claims



1. A power line carrier (PLC) communication system for operation on an electric power distribution system in a premises wherein said power distribution system includes one or more power lines having three wire conductors comprising:

(a) a transmitter unit of said PLC system for transmitting radio frequency (RF) signals over said power line;

(b) a receiver unit of said PLC system for receiving said transmitted RF signals from said power line,

(c) means at said transmitter unit for selectively coupling said RF signals to one pair of two or more different pairs of said power line three wire conductors, and

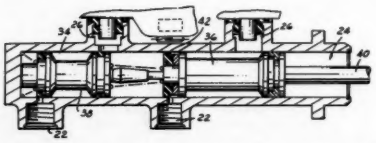
(d) means at said receiver unit for coupling said RF signals from two or more different pairs of said power line three wire conductors to said receiver unit.

5,066,940

BRAKE PEDAL TRAVEL WARNING SYSTEM

Norman G. Schmidt, Toledo, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 10, 1990, Ser. No. 596,649
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—453 17 Claims



1. A brake pedal travel warning system for use in an automotive vehicle, comprising:

a brake pedal;

a master cylinder operatively associated with said brake pedal through a connecting link, said master cylinder including:

a fluid reservoir containing fluid;

a housing including an internal bore communicating with said fluid reservoir through a reservoir port, said bore defining a chamber therein;

an actuator rod extending from said housing and operatively communicating with said connecting link;

a piston slidably disposed in said chamber and operative to reciprocally move therein, a first end of said piston operative to engage said actuator rod; and

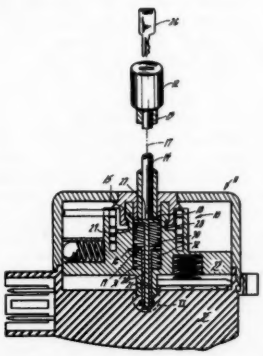
signal generation means operatively associated with said piston for generating a signal after said piston has traveled a predetermined distance in said chamber, said signal generation means comprising a magnetic member producing a magnetic field disposed on said piston and a magnetic field responsive switch member operative to generate a signal in response to the presence of said magnetic field.

5,066,941

INTERNAL KEY-IN-IGNITION-WARNING/IGNITION SWITCH

Daniel Lau, Canton, Mich., assignor to United Technologies Automotive, Dearborn, Mich.

Filed Oct. 23, 1990, Ser. No. 603,980
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—457 4 Claims



1. A key-in-ignition warning switch integrally attached to a rotatable in a housing ignition switch, said warning switch positioned concentric with the rotational axis of the ignition switch, wherein said warning switch rotates with the ignition switch, comprises:

an outer plunger having a cap end, a shaft midsection, and a first shaft flange attached to the end opposite said outer plunger cap end, wherein said first shaft flange includes a first electrical contact surface, and wherein said outer plunger includes a bore extending through said shaft midsection;

an inner plunger which comprises a cap end, a shaft midsection, and a second shaft flange attached to the end opposite said inner plunger cap end, wherein said second shaft flange includes a second electrical contact surface, and wherein said inner plunger extends through said bore

a plunger spring positioned between the shaft side of said inner plunger cap end and the outside surface of said outer plunger cap end, and wherein said plunger spring is concentric with said inner plunger; and

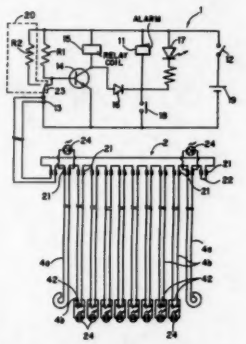
a housing spring positioned between the shaft side of said outer plunger cap end and the housing, and wherein said housing spring is concentric with said plungers.

5,066,942

ANTITHEFT DEVICE FOR ARTICLES

Toichiro Matsuo, Arao, Japan, assignor to Matsuo Sangyo Kabushiki Kaisha, Omuta, Japan

Filed Sep. 11, 1990, Ser. No. 580,674
Claims priority, application Japan, Jun. 1, 1990, 2-58580[U]
Int. Cl.[5] G08B *13/02*
U.S. Cl. 340—568 6 Claims



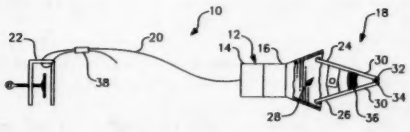
1. An antitheft device for articles comprising:
a plurality of article connection cords, each cord connected to a respective article;
a cord connection part including a plurality of terminal parts connected in series by connection to said plurality of cords, respectively;
a monitor part connected to said cord connection part, such that said monitor part will not operate when said terminal parts are connected in series by said cords and will operate when a) at least one of said terminal parts is disconnected from said cords or b) when at least one of said cords is cut or loosened;
auxiliary alarm means connected in parallel to at least one of the terminal parts in said cord connection part; and
drive means for driving said auxiliary alarm means, corresponding to said terminal part or parts which is disconnected, when said monitor part outputs an alarm.

5,066,943

PATENT MONITORING SYSTEM

Osman S. Demirel, 21729 Cypress Way, and John D. Sanwick, 21026 22nd Ave. W., both of Lynnwood, Wash. 98036

Filed Nov. 28, 1990, Ser. No. 619,226
Int. Cl.[5] G08B *23/00*
U.S. Cl. 340—573 21 Claims



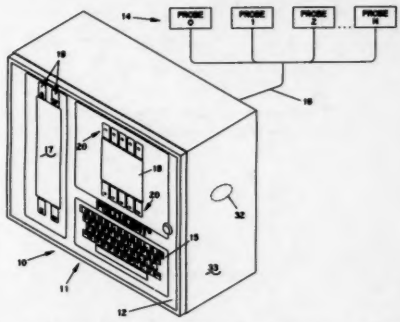
1. A patient monitoring system comprising:
audible message means, including a prerecorded voice message means, that alerts a health care provider of patient movement and informs, instructs, calms, reassures, and orients a patient of his status such that the patient is informed and calmed;
a switch means for attaching to a patient's clothing and for activating said audible message means when said switch means is removed from the patient's clothing; and
means for connecting said switch means to an anchor means such that movement of the patient a predetermined distance away from said anchor means causes said switch means to be removed from the patient's clothing, thereby activating said audible message means.

5,066,944

FLUID DETECTION SYSTEM WITH RELAY RELEASE AND RELATCH FUNCTION

Laurence S. Slocum, Indianapolis, Ind., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 25, 1990, Ser. No. 588,023
Int. Cl.[5] G08B *21/00*
U.S. Cl. 340—603 3 Claims



1. A fluid status detection system comprising: a controller and a plurality of probes for sensing the status of fluids at probe locations remote from the controller, each of said probes including means for providing a plurality of probe signals to said controller indicative of the fluid status at the probe location, said controller comprising:
a relay;
storage means for storing a plurality of latching conditions for said relay;
latching means responsive to said probe signals and communicating with said means for storing for latching said relay upon receipt of a first probe signal corresponding to one of said latching conditions;
release and relatch means for deactivating said relay automatically when said relay is latched and a second probe signal corresponding to the same said latching condition is received while the first probe signal is still present and for relatching said relay after a predetermined time corresponding to the second probe signal being present.

5,066,945

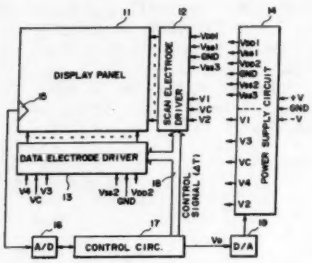
DRIVING APPARATUS FOR AN ELECTRODE MATRIX SUITABLE FOR A LIQUID CRYSTAL PANEL

Hideo Kanno, Kawasaki; Hiroshi Inoue, Yokohama, and Atsushi Mizutome, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 25, 1988, Ser. No. 262,576
Claims priority, application Japan, Oct. 26, 1987, 62-271120; Nov. 12, 1987, 62-284158
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 40 Claims

1. A driving apparatus, comprising:
a) a driving unit including a scanning electrode driver and a data electrode driver for driving an electrode matrix formed of scanning electrodes and data electrodes, and
b) a drive voltage generating unit including a first means for generating a fixed voltage, a second means for generating a source voltage for providing drive voltages for driving the electrode matrix, and a third means for generating a first voltage equal to a subtraction of the fixed voltage from the source voltage and a second voltage equal to a subtraction of the source voltage from the fixed voltage,

wherein the first voltage and the second voltage are of mutually opposite polarities with respect to the fixed voltage, and the fixed voltage is a voltage set to an intermediate value between a maximum output voltage and a minimum output voltage of the drive voltage generating unit.

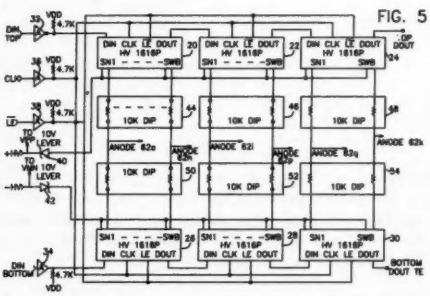


5,066,946

ELECTROPHORETIC DISPLAY PANEL WITH SELECTIVE LINE ERASURE

Frank J. Disanto, North Hills, and Denis A. Krusos, Lloyd Harbor, both of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Filed Jul. 3, 1989, Ser. No. 375,056
Int. Cl.[5] G09G *3/34*
U.S. Cl. 340—787 **15 Claims**



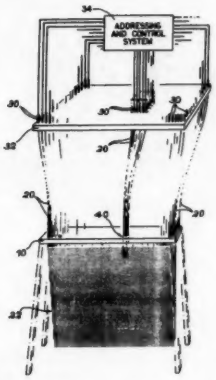
1. An electrophoretic display apparatus comprises a display panel having a display surface and containing an electrophoretic dispersion of particles in a suspension medium, writing means for forming an image on the display surface in a write mode by attracting charged particles from the dispersion onto the display surface in a plurality of image lines, and line erasing means for selectively erasing a particular image line from among said plurality of image lines during a line erase mode, said particular image being erased by repelling charged particles from only a portion of the display surface corresponding to the image line to be erased such that a remainder of said plurality of image lines remains undisturbed during said line erase mode thereby allowing a new frame having substantial portions the same as the previous frame.

5,066,947

VERY LARGE SIZE DISPLAY SCREEN

Francois Du Castel, 103 Avenue Félix Faure, 75015 Paris, France

Filed Jan. 26, 1989, Ser. No. 302,625
Claims priority, application France, Feb. 3, 1988, 88 01251
Int. Cl.[5] G08B *5/00*; G09F *19/12*
U.S. Cl. 340—815.31 **3 Claims**



1. A display device for very large size displays comprising:
at least a solid horizontal rectangular frame having front and rear sides and two lateral sides;
optical fibers having first and second ends, said first ends being secured to said frame so that said optical fibers are suspended from said frame, said second ends being freely suspended, the fibers belonging to a vertical plane parallel to said front and rear sides of said frame having an equal length and the fibers belonging to a vertical plane parallel to said lateral sides having a length increasing from front to rear, said second freely suspended ends defining a large substantially plane display screen;
light emitting diodes located above said frame and optically coupled to said first ends of said optical fibers; and
an addressing and control system connected to said light emitting diodes.

5,066,948

RECEIVER FOR USE IN REMOTE CONTROL SYSTEM

Yoshiyuki Kaneko, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

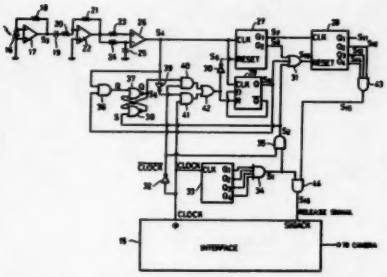
Continuation of Ser. No. 100,828, Sep. 25, 1987, abandoned. This application Sep. 4, 1990, Ser. No. 577,075
Claims priority, application Japan, Oct. 1, 1986, 61-234160
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.69 **10 Claims**

1. A receiver for use in a remote control system in a portable apparatus which makes use of a remote control signal of a predetermined frequency, comprising:
(A) receiving means for receiving a remote control signal wherein said receiving means comprises means for converting a received signal to a digital pulse signal;
(B) counter means for counting the frequency of the digital signal;
(C) control means for controlling said counter means so as to operate in a stand-by state capable of performing the counting operation in synchronism with the frequency of the remote control signal, said control means comprising:
(i) digital change-over means for enabling said control means to commence the controlling operation in synchronism with the reception of the remote control signal received by said receiving means, said digital

change-over means being responsive to a level of the digital signal;

(ii) first digital reset means for resetting said counter means, digitally in response to said receiving means receiving the remote control signal such that a converted digital signal is at a high level at least two times while said counter means is in a stand-by state capable of performing the counting operation;

(iii) second digital reset means for resetting said counter



means, digitally in response to said receiving means receiving the remote control signal while said counter means is in an idle state not capable of performing the counting operation;

(D) means for setting a predetermined period; and

(E) judging means responsive to the counter means for judging the signal received by said receiving means as being the remote control signal when the value counted by said counter means has reached a predetermined value in the predetermined period.

5,066,949

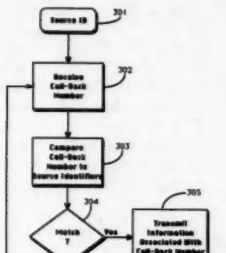
SENDING DIFFERENT IDENTIFIERS TO SELECTED RECEIVERS, TO REPRESENT THE SAME SOURCE

Robert L. Breeden; Richard E. Johnson, both of Boynton Beach; Amy R. Kabcenell, Highland Beach, and Thomas F. Holmes, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 8, 1989, Ser. No. 433,242

Int. Cl.[5] G08B *5/22;* **H04Q** *1/30;* **H04M** *11/00*

U.S. Cl. 340—825.44 **2 Claims**



2. A terminal for generating a selective cell message to first and second selective cell receivers, comprising:

(a) means for receiving a signal comprising a received source identifier and a message to provide a received signal;

(b) means for comparing said received source identifier with stored source identifiers within said terminal to determine first and second transmitted source labels; and

(c) means for transmitting said message and said first transmitted source label to said first selective cell receiver, and said message and said second transmitted source label to said second selective cell receiver.

5,066,950

TRAFFIC SAFETY MONITORING APPARATUS

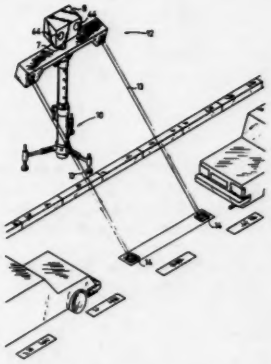
Naftali Schweitzer; Joseph S. Bodenheimr, both of Jerusalem, and Gerald B. David, Savion, all of Israel, assignors to Driver Safety Systems Ltd., Herzliya on Sea, Israel

Filed Apr. 27, 1989, Ser. No. 344,161

Claims priority, application Israel, Apr. 27, 1988, 86202

Int. Cl.[5] G08G *1/017, 1/054*

U.S. Cl. 340—937 **19 Claims**



1. A traffic monitoring system comprising:

means for establishing a pair of precisely spaced radiation beams in association with a thoroughfare, whereby passage of a vehicle along the thoroughfare interrupts the radiation beams;

means for sensing interruption of the radiation beams and providing output indications of vehicle speed and separation between adjacent vehicles; and

means for photographing vehicles fulfilling predetermined criteria including photography trigger apparatus which is responsive to the sensed vehicle speed of the vehicle being photographed for timing the acquisition of a photographic record of the vehicle, thereby providing a consistently positioned photographic record of the vehicle, irrespective of vehicle speed.

5,066,951

CIRCUIT ARRANGEMENT FOR ADJUSTING THE TRIGGERING POINT OF AN INDUCTIVE KEYBOARD

Horst Münster, Brigachtal, and Hans-Jürgen Wendt, Villingen-Schwenningen, both of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Oct. 24, 1989, Ser. No. 426,893

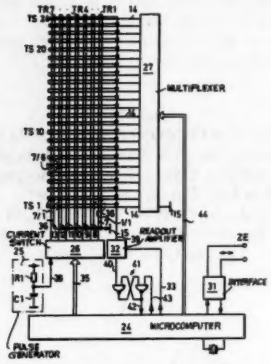
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 3836733

Int. Cl.[5] H03M *11/00;* **G06F** *3/02*

U.S. Cl. 341—32 **19 Claims**

1. In a circuit for an inductive keyboard wherein each key comprises a magnetic member which when moved into primary and secondary windings alters the coupling generating a coupling signal when a current pulse drives the primary wind-

ing and having means for adjusting the triggering level of the moved member while reducing mechanical and electric tolerances, the improvement comprising means under the control of



a microcomputer for changing the steepness of the driving current pulse for presetting the triggering level for each keyboard key.

5,066,952

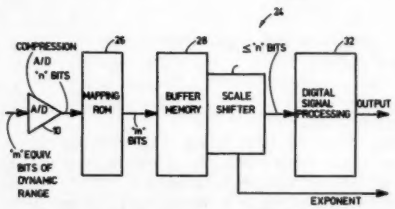
NON-LINEAR DATA CONVERSION SYSTEM FOR DYNAMIC RANGE DIGITAL SIGNAL PROCESSING

Steve J. Koerner, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 25, 1989, Ser. No. 412,248

Int. Cl.[5] H03M *1/62, 7/00, 7/30*

U.S. Cl. 341—138 **17 Claims**



1. A data acquisition arrangement for a data signal processing system, comprising:

a non-linear data compression and conversion arrangement, said arrangement including

(a) means for converting an analog signal to a digital signal,

(b) means for defining a multiplicity of graduated reference voltages of unequal values relative to one another operatively associated with an input to said converting means, and

(c) means operatively disposed between an output of said defining means and the input to said converting means for comparing an analog signal concurrently to said multiplicity of granduated reference voltages and providing a non-liner compressed analog signal to said converting means as a result of the comparison for producing said digital signal in the form of a compressed conversion of said analog signal; and

a data decompression and scaling arrangement connected to and located downstream of said converting means of said data compression and conversion arrangement for receiving said compressed digital signal from said converting means and for decompressing and scaling said compressed digital signal so as to provide only the most significant bits of a decompressed digital signal for data signal processing.

5,066,953

POSITION MEASURING APPARATUS WITH A SUBDIVISION CIRCUIT FOR SUBDIVIDING SINUSOIDAL SCANNING SIGNALS

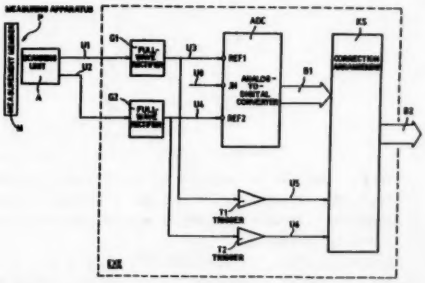
Hans Lengenfelder, Mühldorf, and Robert Wasthuber, Garching, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 7, 1989, Ser. No. 432,587

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 3838291

Int. Cl.[5] H03M *1/34*

U.S. Cl. 341—155 **20 Claims**



1. Position measuring apparatus having a subdivision circuit for subdividing position-dependent analog periodic scanning signals, the subdivision circuit having first and second analog periodic scanning signals phase-displaced with respect to one another as inputs thereto and a digital N-bit data word which represents intermediate values of a signal period of the first and second analog periodic scanning signals as an output therefrom, characterized in that the subdivision circuit includes an analog-to-digital converter and rectifier circuits which derive from the first and second analog periodic scanning signals first and second full-wave rectified signals, so that to a first input of the analog-to-digital converter there is applied the first full-wave rectified signal having signal values only greater than or equal to a direct-voltage constituent of the analog periodic scanning signals, and to a second input of the analog-to-digital converter there is applied the second full-wave rectified signal having signal values only smaller than or equal to the direct-voltage constituent of the analog periodic scanning signals.

5,066,954

ANALOG TO DIGITAL CONVERTER WITH REFERENCE VOLTAGE CONTROL AND ANALOG STYLE DISPLAY

Johannes Bürgel, Tettnang, and Jean L. Lamarche, Langenargen, both of Fed. Rep. of Germany, assignors to I F M Electronic GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 4, 1990, Ser. No. 504,473

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 3911457

Int. Cl.[5] H03M *1/34*

U.S. Cl. 341—158 **20 Claims**

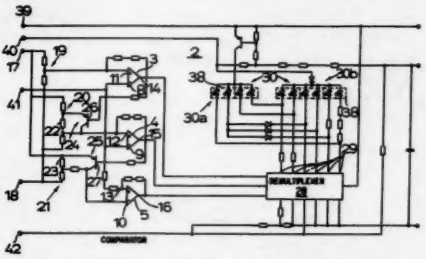
1. A circuit arrangement for converting an analog measured voltage into a digital measurement signal, having

a plurality of comparators, where the measured voltage and various reference voltage dividers are provided for obtaining the reference voltages and the voltage dividers are connected to a standard voltage, where the reference voltage for the second comparator is controllable by the initial signal of the first comparator,

a reference voltage for the third comparator which is controllable by the output signal of the first comparator, the output signal of the second comparator or both the output

signals of the first and second comparators, and where the measurement signal displayable by the sum of the output signals of all comparators,

where the voltage divider for the reference voltage of the second comparator and the voltage divider for the reference voltage of the third comparator each have a voltage divider resistor which can be short-circuited,



where control transistors are assigned to the voltage divider resistors which can be short-circuited,

where the base of each of the control transistors is connected to the output of a comparator, and where an analog demultiplexer is connected to the outputs of the comparators.

5,066,955

ANALOG TO DIGITAL CONVERTERS WITH CONVERGENCE ACCELERATING SIGNALS

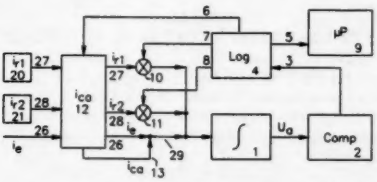
Joachim Scheerer, Am Fort Weisenau 38, 6500 Mainz 1, and Hartmut Grützediek, An der Klosterheck 16, 6500 Mainz 43, both of Fed. Rep. of Germany

Filed Jun. 27, 1990, Ser. No. 544,682

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921976

Int. Cl.[5] H03M *1/50*

U.S. Cl. 341—168 **26 Claims**



1. Analog to digital converter comprising a charge storage or charge summation circuit which continuously up-integrates the input signal i_e, followed by a comparator, a logic circuit which at periodically recurring instants defined by an oscillator, a timebase counter and a bistable stage, the time between two successive such instants being called a sub-measurement, connects via an analog switch a first reference current/voltage to the charge storage or charge summation circuit for additional integration and disconnects the previously up-integrated second reference current/voltage with the aid of a second analog switch and after a predefined number of oscillator pulse flanks after the next following passage of the output voltage of the charge storage or charge summation circuit through the comparator threshold switches off again the first reference current/voltage and the second reference current/voltage on again, a gate and a result counter contained in the logic circuit which by counting the oscillator pulses during the time in which the first or the second reference current/voltage is being up-integrated in addition to the input signal, determines a first digital value which is passed on to a measured value processing circuit, wherein at the input of the charge storage or charge summation circuit used for the input signal or at one of its other inputs, convergence accelerating signals are superimposed after every nth (n=1,2,3, . . .) sub-measurement whereby the Taylor series expansions of these convergence accelerating signals according to time in the time interval of a sub-measurement are first or higher order polynomials.

5,066,956

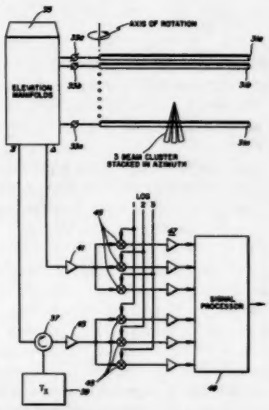
AZIMUTH-STACKED RADAR METHOD AND APPARATUS

Raymond G. Martin, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 27, 1989, Ser. No. 441,801

Int. Cl.[5] G01S *13/44*; H01Q *3/22*

U.S. Cl. 342—154 **7 Claims**



1. A surveillance radar system, comprising:

a transmitter for generating at an output thereof radiant energy pulses of a predetermined duration and interpulse period, each of the generated pulses including a plurality of contiguous subpulses, each subpulse having a frequency different and sufficiently separated from the frequency of the other subpulses of the same generated pulse to create a distinct beam in an azimuth direction different and sufficiently separated from the distinct beam of each of the other subpulses of the same pulse when applied to an antenna having azimuth squint characteristics;

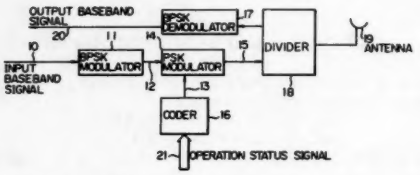
a mechanically rotatable antenna having a plurality of horizontal end-fed rows of antenna elements connected to the output of the transmitter, each of said antenna elements having azimuth squint characteristics, said antenna including antenna elevation manifolding means configured to form an elevation beam pair having sum and difference receive elevation patterns; and

a plurality of distinct receiving means, each of said plurality being associated with one of the subpulses of a radiant energy pulse, for receiving return energy of a corresponding frequency, each of the plurality of distinct receiving means includes a first receiver for receiving an elevation sum (Σ) signal of each beam pair, and a second receiver for receiving an elevation difference (Δ) signal of each beam pair.

5,066,957
HYBRID MODULATION SATELLITE COMMUNICATION SYSTEM

Toshio Mizuno, Sayama; Takuro Muratani, Noda; Yasuhiko Ito, Tokyo; Tatsuo Watanabe, Tokyo, and Takashi Inoue, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 511,681
Claims priority, application Japan, Apr. 21, 1989, 1-99936; Jan. 23, 1990, 2-11926
Int. Cl.[5] H04B 7/005, 7/185
U.S. Cl. 342—352 11 Claims



1. Hybrid modulation satellite communication system, comprising:

a satellite;

relay earth station;

a plurality of small earth stations operably coupled with one another through said satellite and said relay earth station,

each of said plurality of small earth stations having smaller antenna and weaker transmit power than those of said relay earth station,

each of said small earth stations having primary modulator means for receiving and modulating carrier wave based on a first information signal, and for transmitting a primary information signal therefrom,

said relay earth station having first demodulator means for receiving and demodulating said primary information signal from said plurality of small earth stations,

at least one of said small earth stations having a secondary modulator means for receiving said primary information signal from said primary modulator means and for secondary modulation of said primary information signal, wherein said secondary modulator means further receives a second information signal, wherein said secondary modulator means modulates said primary information signal based on said second information signal, wherein said second information signal includes operation status information, and wherein a secondary modulated signal outputted from said secondary modulator means carries said primary information signal and said secondary information signal, and

said relay earth station further having a secondary demodulator means for receiving and demodulating said secondary modulated signal from said plurality of small earth stations.

5,066,958
DUAL FREQUENCY COAXIAL FEED ASSEMBLY

Gerry B. Blachley, Simi Valley, Calif., assignor to Antenna Down Link, Inc., Las Vegas, Nev.

Filed Aug. 2, 1989, Ser. No. 389,014
Int. Cl.[5] H01Q 13/02
U.S. Cl. 343—756 8 Claims

1. A dual frequency, coaxial feed assembly for receiving electromagnetic signals and conveying them to a signal utilization means outside of said coaxial feed assembly, comprising:

a body defining a front aperture and a first closed rear waveguide cavity therein having at least one sidewall and an end wall;

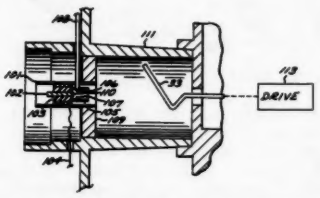
a first probe mounted within said first waveguide cavity for receiving electomagnetic energy in a first preselected band of frequencies;

means conducting electromagnetic energy received by said first probe through the rear of said body to a signal utilization means;

means defining a second front aperture and second closed rear waveguie cavity therein of smaller dimension than said first closed rear waveguide cavity;

a second probe mounted within said second waveguide cavity for receiving electomagnetic energy in a second preselected band of frequencies, said second preselected band of frequencies being higher than said first band of frequencies;

support means supporting said second probe in said second waveguide cavity;



means mounting said second waveguide cavity coaxially within said first waveguide cavity and spaced apart from each of the walls of said first waveguide cavity;

wherein the support means includes electronic switch means for changing the polarization of incident energy received by at least one of said first probe and second probe;

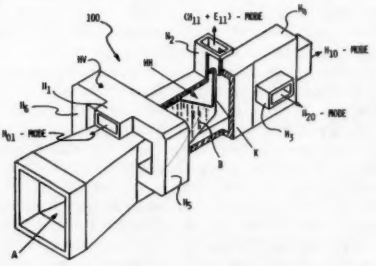
control lead means for carrying electrical control signals to said electronic switch means, to control the polarization of incident energy received by at least one of said first probe and second probe;

a coaxial line extending into said first waveguide cavity, spaced from said first probe, for conducting electromagnetic energy received by said second probe to the exterior of said assembly.

5,066,959
MODE COUPLER FOR MONOPULSE APPLICATIONS HAVING H_{01} MODE EXTRACTING MEANS

Bernhard Huder, Ulm, Fed. Rep. of Germany, assignor to Telefunken Systemtechnik GmbH, Ulm, Fed. Rep. of Germany

Filed Dec. 1, 1989, Ser. No. 443,955
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1988, 3840450
Int. Cl.[5] H01P 1/161; H01Q 25/02
U.S. Cl. 343—786 5 Claims



1. In a mode coupler for monopulse applications in an antenna feed system for obtaining angle deviations in azimuth and elevation, said coupler having a rectangular main wave guide with a portion at one end in which a plurality of electromagnetic wave modes, including a dominant H_{10} mode, and higher

order H_{20} and $(H_{11}+E_{11})$ modes, of an illuminating signal can be propagated, a plurality of mode-selective input and output coupling ports which are all formed as respective simple standard rectangular wave guides mounted on the main wave guide where each standard rectangular wave guide has a shorter and a longer cross-sectional axis and is of a size for propagation of only said H_{10} mode, means for coupling out the $(H_{11}+E_{11})$ mode including a separator plate means disposed in said main wave guide portion for converting the $(H_{11}+E_{11})$ mode into two phase-opposed wave guide waves and for coupling said two waves, via a coupling loop, into one of said standard wave guides which is mounted on a side of said main wave guide portion, and which has its said longer cross-sectional axis transverse to a longitudinal axis of said main wave guide, said separation plate means being disposed so that a front edge of said separator plate means is a reflector for the H_{01} mode, means for coupling out the H_{10} mode including a further one of said standard wave guides connected to an end of said main wave guide opposed said one end and having a longitudinal axis extending parallel to said longitudinal axis of said main wave guide, and means for coupling out the H_{01} mode including at least one of said standard wave guides, the improvement wherein:

said means for coupling out the H_{01} mode from said main wave guide portion includes a pair of said standard wave guides having first respective ends mounted symmetrically on opposite sides of said main wave guide portion adjacent said front edge of said separator plate means and having their respective other ends connected by a wave guide junction, consisting of an H-plane junction, to a common output of one of said standard wave guides.

5. A mode coupler as defined in claim 1, further comprising an antenna coupled to said one end of said main wave guide, with said antenna being in the shape of a pyramidal horn.

5,066,960

THERMAL PRINTING HEAD

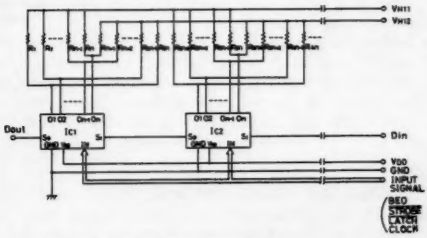
Katsuyasu Deguchi, Nara; Takatoshi Mizoguchi, Kyoto; Takayuki Taminaga, Yamatokoriyama, and Akiyoshi Fujii, Nara, all of Japan, assignors to Sharp, Osaka, Japan

Filed Apr. 4, 1990, Ser. No. 503,974

Claims priority, application Japan, Apr. 5, 1989, 1-86480; Aug. 25, 1989, 1-219203; Aug. 28, 1989, 1-222174

Int. Cl.[5] B41J *2/335*

U.S. Cl. 346—76 PH **11 Claims**



1. A thermal printing head, comprising:

an insulating substrate formed of a heat resisting cloth impregnated with a heat resisting resin;

a plurality of heating elements of an electrically resistive material linearly disposed on said substrate including 2n elements numbered from 1 to 2n in linear arrangement (n being a natural number);

a shield layer interposed between said plurality of heating elements and said insulating substrate for preventing said insulating substrate from exerting chemical influence on said plurality of heating elements;

conduction controlling means, mounted on said insulating substrate, for controlling electric conduction of said plurality of heating elements corresponding to printing of data;

a common electrode formed on said insulating substrate for commonly connecting an end of each of said plurality of heating elements, wherein said common electrode is separated into first and second common electrodes and;

a plurality of discrete electrodes formed on said substrate, said plurality of discrete electrodes for connecting the other end of each of said plurality of heating elements to said conduction controlling means; and

a metal layer interposed between said plurality of heating elements and said plurality of discrete electrodes for connection in a ohmic contact,

said plurality of heating elements being divided into a first block of heating elements numbered from 1 to n and a second block of heating elements numbered from n+1 to 2n,

one end of each of said plurality of heating elements in the first block being connected to said first common electrode, and one end of each of said plurality of elements in the second block being connected to said second common electrode,

a pair of the other ends of said elements numbered 1 and 2n, elements numbered 2 and 2,−1, . . . , elements numbered i and 2n+1−i (i being a natural number, 1<i<n . . .), elements numbered n and n+1 being connected to said conduction controlling means.

5,066,961

TONAL PRINTER UTILIZING HEAT PREDICTION AND TEMPERATURE DETECTION MEANS

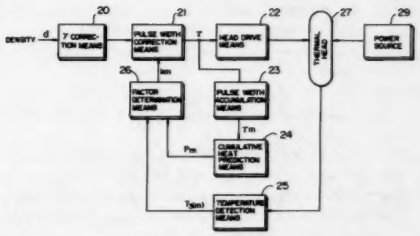
Haruo Yamashita, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 12, 1990, Ser. No. 478,477

Claims priority, application Japan, Feb. 17, 1989, 1-038609

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **10 Claims**



1. A tonal printer comprising: γcorrection means for converting tonal data including at least one of density data and luminance data supplied thereto into corresponding pulse width data required to obtain a predetermined recording density;

a thermal head comprising an alignment of heating elements, a heating element substrate and a head mount;

head drive means for driving each heating element of said thermal head;

a power source which supplies power to said thermal head;

cumulative head prediction means for providing an output representing a prediction of an amount of cumulative heat in a portion of said heating element substrate of said thermal head;

temperature detection means for providing an output representing a temperature in a portion of said head mount of said thermal head; and

factor determination means for determining a compensation factor of energy, which is applied to said thermal head, from said output representing the temperature of said head mount and said output of said cumulative heat prediction means,

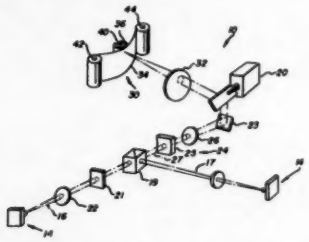
said printer operating to vary the applied energy to said heating elements of said thermal head by using said compensation factor.

5,066,962

LASER THERMAL PRINTER HAVING A LIGHT SOURCE PRODUCED FROM COMBINED BEAMS

Sanwal P. Sarraf, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1989, Ser. No. 457,593
Int. Cl.[5] H04N *1/23*
U.S. Cl. 346—76 L 15 Claims



6. A thermal printer for forming an image on a thermal medium, said medium including a dye is transferred by sublimation from a donor to a receiver as a result of heating the dye in the donor, said printer comprising:

means for supporting a thermal medium, said supporting means including means for supporting a donor element and means for supporting a receiver element;

means for driving said means for supporting a thermal medium;

a light source which includes a pair of diode lasers;

means for modulating said diode lasers in accordance with an information signal to produce modulated beams;

means for combining said modulated beams to form a combined beam;

optical means for shaping said combined beam;

means for scanning said combined beam across said medium; and

means for controlling said scanning means, said modulating means, and said driving means in timed relation to each other, said controlling means including means for controlling said modulating means so that said combined beam contains a single information signal.

5,066,963

INK JET HEAD HAVING HEAT-GENERATING RESISTOR COMPRISED OF A COMPLEX COMPOUND

Isao Kimura, Hiratsuka, and Kenji Hasegawa, Isehara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

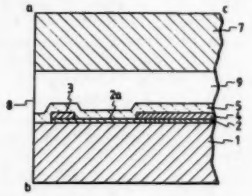
Continuation of Ser. No. 510,885, Apr. 18, 1990, abandoned. This application Mar. 15, 1991, Ser. No. 670,402
Claims priority, application Japan, Apr. 18, 1989, 1-96419
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 26 Claims

1. An ink jet head, comprising:

a discharge opening for discharging ink and an electrothermal transducer having a heat-generating resistor member which generates in accordance with a signal heat energy for discharging the ink through said discharge opening, wherein

said heat-generating resistor member comprises a complex compound comprising each of a metal element, B, Si and N, said complex compound having the compositional ratios:

8 atomic % ≦ metal element ≦ 31 atomic %



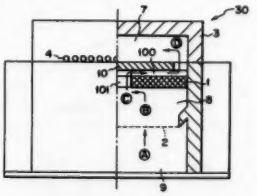
7 atomic % ≦ B ≦ 58 atomic %
5 atomic % ≦ Si ≦ 53 atomic %
6 atomic % ≦ N < 45 atomic %.

5,066,964

RECORDING HEAD HAVING COOLING MECHANISM THEREFOR

Tsuguhiro Fukuda, Yokohama; Hiroshi Nakagomi, Yamato, and Seiichirou Karita, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 385,078, Jul. 25, 1989, abandoned. This application Feb. 20, 1991, Ser. No. 658,435
Claims priority, application Japan, Jul. 26, 1988, 63-184691
Int. Cl.[5] B41J *2/05*
U.S. Cl. 346—140 R 8 Claims



1. A liquid-jet recording head comprising:

an ejection opening for ejecting liquid;

a first liquid path communicating with the ejection opening;

a substrate having an electrothermal energy transducer for generating heat energy provided in correspondence with the ejection opening; and

a heat-capacity member, wherein said substrate and said heat-capacity member together form a second liquid path of predetermined length along said substrate for supplying the liquid to the first liquid path, wherein the second liquid path permits liquid to be held in and to flow therethrough.

5,066,965

WATERPROOF AND/OR WATER-RESISTANT CAMERA

Hitoshi Tanaka, and Kosei Kosako, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1990, Ser. No. 581,363
Claims priority, application Japan, Feb. 6, 1990, 2-10650[U]; Feb. 6, 1990, 2-26739
Int. Cl.[5] G03B *17/08*
U.S. Cl. 354—64 14 Claims

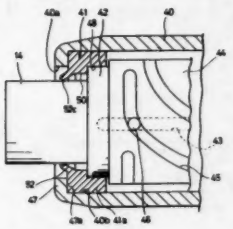
1. A waterproof and/or water-resistant camera, comprising:

an opening in a camera body in which a photographing lens barrel is movable in an optical axis direction; and

an annular seal member which is positioned between said photographing lens barrel and said opening,

wherein said annular seal member is provided, on an outer periphery, with a secured portion to be secured to an inner

periphery of said opening and is provided, on an inner periphery, with a lip portion which elastically comes into close contact with an outer periphery of said photographing lens barrel, and which is elastically deformable independently from said secured portion, said lip portion projecting forwardly in the optical axis direction as viewed from said camera body.



5,066,966

HOLDING MECHANISM FOR A CAMERA

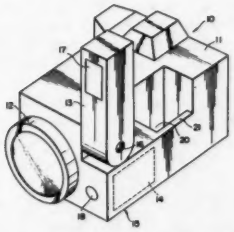
Kiyoshi Kawano, Rochester, N.Y., assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,351

Claims priority, application Japan, Mar. 27, 1989, 1-34637[U]

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—82 **9 Claims**



1. A holding mechanism for a camera including a taking lens barrel and a camera body, said camera body having a bottom surface, said holding mechanism comprising an opening portion successively formed with and adjacent to a bottom surface of said taking lens barrel of said camera, and an arm member arranged to be rotatable between a first position at which said arm member is opposed to an object to be photographed and a second position at which said arm covers said opening portion, said arm member being provided with a strobe light element for radiating light when the object is photographed.

5,066,967

SINGLE-LENS REFLEX CAMERA WITH BUILT-IN FLASH

Masato Yamamoto; Susumu Koshino; Toshimasa Yamanaka; Koji Sato; Akihiro Arai, and Masahiro Koinuma, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 244,271, Sep. 14, 1988, Pat. No. 4,910,542, which is a continuation of Ser. No. 934,055, Nov. 24, 1986, now Re. 4,893,140. This application Nov. 20, 1989, Ser. No. 450,886

Claims priority, application Japan, Nov. 22, 1985, 60-261238; Dec. 4, 1985, 60-271373; Dec. 25, 1985, 60-198374[U]; Jan. 31, 1986, 61-11595[U]; Feb. 5, 1986, 61-14482[U]

Int. Cl.[5] G03B *15/03*

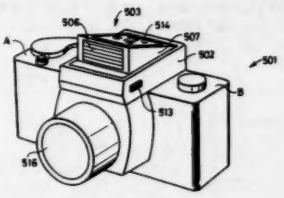
U.S. Cl. 354—149.11 **7 Claims**

1. A single-lens reflex camera, comprising:

a single-lens reflex camera body having a principal photographic axis;

a pentaprism included in said camera body over said principal photographic axis for operator viewing along said principal photographic axis;

a movable light emitter built into said camera body, disposed at least partially above said pentaprism and being movable from an operating position in which said camera is operable for taking flash pictures to a non-operating position in



which said camera is operable for taking non-flash pictures; and

an information display member mounted on a housing of said light emitter and electrically displaying conditions of said camera, said information display member being movable with said light emitter when said light emitter moves from said operating position to said non-operating position, and being operational and viewable when said light emitter is in the non-operating position.

5,066,968

AUTOFOCUSING SYSTEM FOR A CAMERA

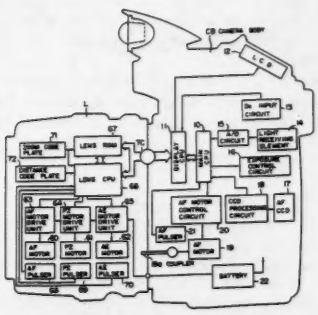
Noboru Suzuki; Shigeo Toji, both of Tokyo, and Masahiro Kawasaki, Saitama, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 414,477

Claims priority, application Japan, Sep. 29, 1988, 63-245683; Sep. 29, 1988, 63-245684

Int. Cl.[5] G03B *13/00*

U.S. Cl. 354—400 **46 Claims**



1. An autofocusing system for a camera having a photographic lens including a focusing lens group and a zooming lens group, said system comprising:

means for driving said focusing lens group to obtain an in-focus condition of an object to be photographed;

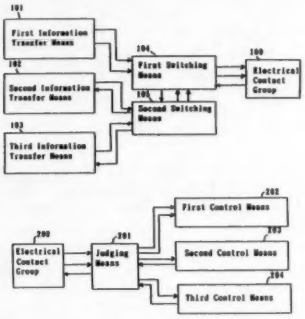
means for driving said zooming lens group for zooming said photographic lens;

focus lock means for disabling said focus-drive means once said photographic lens is brought into said in-focus condition; and

re-focus means for re-enabling said focus drive means to drive said focus lens group so as to ensure that said photographic lens is in said in-focus condition when said zoom-

ing lens group is driven by said zoom drive means after said focus drive means is disabled by said focus lock means.

5,066,969
CAMERA SYSTEM
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 29, 1989, Ser. No. 400,014
Claims priority, application Japan, Aug. 30, 1988, 63-215991
Int. Cl.[5] G03B *13/36, 5/00, 7/20*
U.S. Cl. 354—402 **35 Claims**



1. A photographic lens detachably mounted to a camera body, comprising:

a group of electrical contacts which are selectively connected to said camera body;

first information transfer means for transmitting a first set of information peculiar to said lens through at least a part of said electrical contact group;

second information transfer means for transmitting a plurality of variable information peculiar to said lens through memory means connected to said electrical contact group to said camera body;

third information transfer means for transmitting and receiving information to and from said camera body through an arithmetic/control means connected said electrical contact group; and

switching means for selecting said first information transfer means, second information transfer means or third information transfer means, based on the electrical connection of said electrical contact group to said camera body.

5,066,970
SWINGING TYPE CAMERA
Tsuyoshi Kakita, and Masazi Yoshimura, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Oct. 12, 1990, Ser. No. 596,396
Claims priority, application Japan, Oct. 16, 1989, 1-268323
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—402 **4 Claims**

1. A camera comprising:

means for measuring distance from the camera to an object;

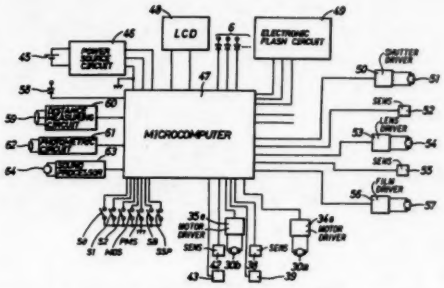
means for automatically photographing a frame in response to detection of a sound;

means for rotating the camera in at least one plane;

means for detecting the rotational angle of the camera;

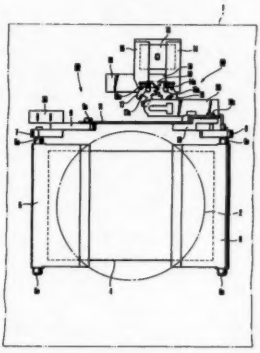
first means for determining, prior to photographing, distances and angular extents of each of several objects surrounding the camera;

second means for determining which of said objects have said distances and angular extents consistent with predetermined criteria and for storing the rotational angle of the so-determined objects; and



means for successively rotating the camera to each stored angular position.

5,066,971
CAMERA
Takanori Kodaira, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 222,388, Jul. 21, 1988, abandoned, which is a continuation of Ser. No. 105,016, Oct. 6, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,315
Claims priority, application Japan, Oct. 9, 1986, 61-240836; Oct. 9, 1986, 61-240837; Oct. 9, 1986, 61-240838; Oct. 9, 1986, 61-240839
Int. Cl.[5] G03B *17/18, 1/00, 13/02*
U.S. Cl. 354—465 **7 Claims**



1. A camera capable of changing the picture frame size, comprising:

changeable picture frame forming means for changing the picture frame size;

a finder device;

finder state changeable means for changing the state of said finder device in response to a change of said picture frame size by said changeable picture frame forming means, said finder state changeable means constituting a unit together with said finder device; and

fastener means for fixing said unit to a body of the camera, said fastener means being able to adjust the fixed position.

5,066,972

IMAGE FORMING APPARATUS WITH POSITIONAL ADJUSTMENT OF EXPOSURE AREA ACCORDING TO IMAGE SIZE

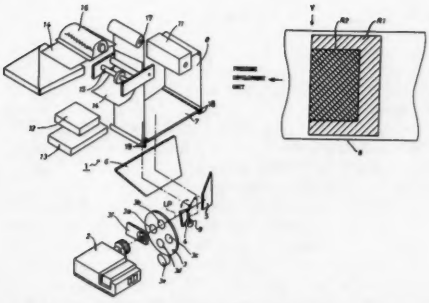
Osamu Nagata, Aichi, and Kazumasa Makino, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Dec. 20, 1990, Ser. No. 630,509

Claims priority, application Japan, Dec. 29, 1989, 1-151433[U]

Int. Cl.[5] G03B 27/52

U.S. Cl. 355—27 18 Claims



1. An image forming apparatus comprising:

means for storing an elongated photosensitive recording medium;

feed means for feeding the photosensitive recording medium from the storing means along a predetermined feed path;

exposure means for exposing the photosensitive recording medium to a light image, the exposure means having an exposure position downstream of the storing means in the feed path;

development means, disposed downstream of the exposure position in the feed path, for developing an exposed portion of the photosensitive recording medium to form a visible output image;

size selection means for selecting a desired size of the visible output image from among plural different image sizes including a maximum image size; and

exposure area setting means for setting an exposure area to be exposed to the light image on the photosensitive recording medium placed at the exposure position, the exposure area corresponding to the image size selected by the size selection means, wherein a center line of the exposure area corresponding to the image size smaller than the maximum image size is offset from a center line of the exposure area corresponding to the maximum image size in a downstream direction of the feed path.

5,066,973

IMAGE FORMING APPARATUS USING AN ELONGATED WEB-LIKE RECORDING MEDIUM

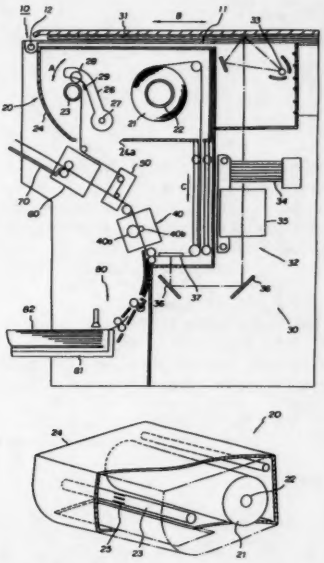
Satoru Kuwabara, Chiryu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 16, 1990, Ser. No. 614,235

Claims priority, application Japan, Feb. 13, 1990, 2-31942

Int. Cl.[5] G03B 27/52

U.S. Cl. 355—27 16 Claims



1. An image forming apparatus for forming an image using an elongated web-like recording medium, comprising:

a supply member detachably installed in said apparatus on which said recording medium is wound;

image forming means for forming the image on said recording medium supplied from said supply member;

a winding member detachably installed in said apparatus to take up said recording medium supplied from said supply member, wherein said winding member has information on specific characteristics of said recording medium;

reading means for reading said characteristics information; and

control means for controlling said image forming means according to said characteristics information read by said reading means, wherein said information comprises a bar code and said reading means comprises an optics type reader.

5,066,974

AUXILIARY EXPOSURE DEVICE FOR IMAGE RECORDING APPARATUS

Takashi Nakata, and Tauyoshi Suzuki, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 19, 1990, Ser. No. 615,804

Claims priority, application Japan, Jan. 19, 1990, 2-4213[U]

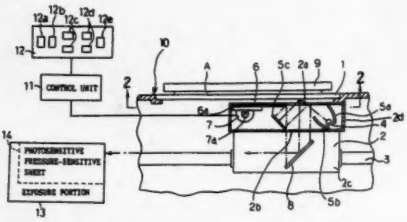
Int. Cl.[5] G03B 27/72

U.S. Cl. 355—71 16 Claims

7. An auxiliary exposure device for an image forming apparatus for forming an image copy on a recording medium by moving an original image and a light source relative to one another and irradiating the recording medium with light emit-

ted from the light source and reflected from the original image: comprising:

a reflection member controllably insertable into a light path from the light source to the recording medium, a lower surface of said reflection member providing a reflection surface for light from the light source;



drive means for inserting and withdrawing said reflection member from the light path;

input means for inputting copying conditions; and

a control means for controlling said drive means on the basis of information from said input means.

5,066,975

SYSTEM FOR CONTROLLING MOVEMENT OF A DOCUMENT TABLE IN A COPYING APPARATUS

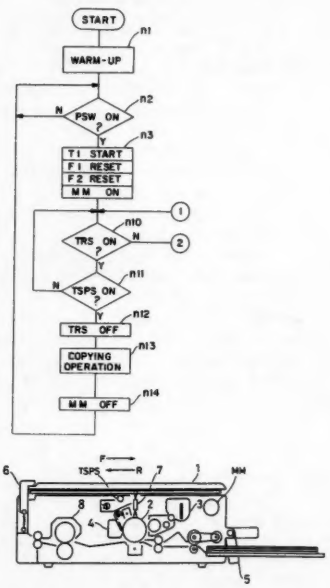
Yasushi Nakanishi, Yamatokoriyama, and Takahiro Fukunaga, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1989, Ser. No. 353,045

Claims priority, application Japan, May 31, 1988, 63-135320

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—200 **4 Claims**



1. An improved system for controlling movement of a document table in a copying apparatus which is provided with a print switch, a movable document table and a lock member for locking said document table, said lock member being disposed on one side of the apparatus perpendicular to a direction of movement of the document table, wherein the improvement comprises:

means for moving the document table in a direction in which said document table is released from said lock member so that upon operation of said print switch, said document table initially moves to automatically disengages said document table from said lock member, said means further moving said document able to a start position from which the apparatus can start a copying operation.

5,066,976

IMAGE FORMING APPARATUS HAVING A PRINT CARTRIDGE

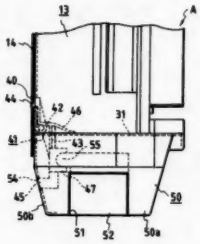
Takashi Kanagawa; Yutaka Shiino, and Tetsuya Furuyama, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 672,977

Claims priority, application Japan, Mar. 19, 1990, 2-69203

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **4 Claims**



1. An image forming apparatus comprising an apparatus body having a guide rail; and a print cartridge movable along said guide rail;

said guide rail having a first engaging portion;

said print cartridge including a holder member and a cover covering said holder member;

said cover having a opening portion; and

said holder member having a second engagement portion which is adapted to be pushed so as to be engaged with said first engaging portion, and an operating portion which is responsive to the engagement of said second engagement portion with said first engaging portion so as to be moved into and out of said cover through said opening portion of said cover.

5,066,977

SYSTEM FOR MANAGING THE NUMBER OF IMAGE FORMING OPERATIONS IN AN IMAGE FORMING APPARATUS

Ken Yoshizuka, Nagaokakyo, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 14, 1990, Ser. No. 567,078

Claims priority, application Japan, Aug. 31, 1989, 1-226758

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—201 **4 Claims**

1. A system for managing the number of image forming operations of an image forming apparatus comprising:

a code input means for inputting a user code;

a sheet counter for counting a number of sheets processed by a main unit of said image forming apparatus;

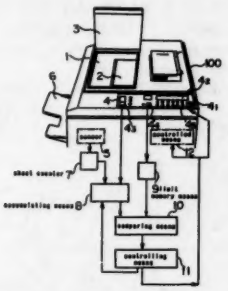
an accumulating means for calculating an accumulated number of sheets for each user from data in said user code supplied from said code input means and a count number counted by said sheet counter;

a limit setting means for setting a predetermined number of sheets assigned to said user;

a limit memory means for recording said predetermined number of sheets said user set by said limit setting means;

a comparing means for comparing between said predetermined number of sheets recorded in said limit memory means and said accumulated number of sheets calculated by said accumulating means; and

a controlling means for, upon judging from said comparing at said comparing means that said accumulated number of sheets of said user exceeds said predetermined number of sheets, forcing image forming operation of said apparatus



to continue up to a specified number of sheets desired at the time by said user and means for delivering an instruction to said main unit of said apparatus for inhibiting image forming operation of said apparatus by said user from the next time and designating an excess number of sheets over said predetermined number of sheets as an initial setting number of said accumulating means for calculation of an accumulated number of sheets after resetting by a renewal arrangement.

5,066,978

IMAGE FORMING APPARATUS HAVING AN EXCHANGEABLE UNIT EXCHANGE TIMING INDICATING DEVICE

Shinichi Watarai, Yokohama; Megumi Yasuda, Kawasaki; Yoji Houki, Tokyo, and Yukio Nishio, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 31, 1989, Ser. No. 359,012

Claims priority, application Japan, Jun. 2, 1988, 63-136115

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—206 **10 Claims**

1. An image forming apparatus for forming an image on a medium wherein said apparatus comprises;

a driving source;

a plurality of processing devices for forming an image on said medium and being consumable and exchangeable individually, and said processing devices including at least a drum unit, a developing unit, and a fixing unit;

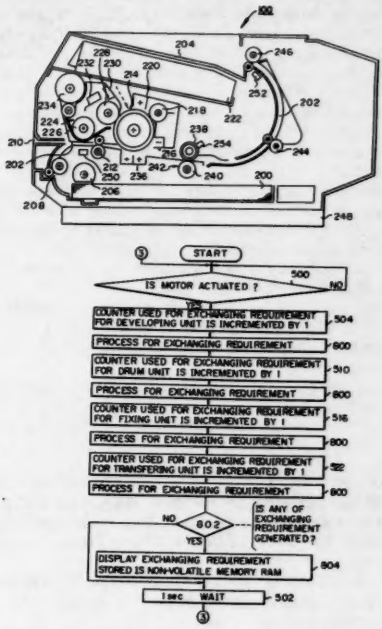
a means for transmitting the driving force of said driving source to each said processing devices so as to rotate said drum unit, said developing unit, and said fixing unit in accordance with driving motion of said driving source;

means for integrating a working time of each of the processing devices respectively in accordance with a driving time of said driving source to obtain an integrated working time of each processing device respectively;

a memory means for storing said integrated working time of each processing device respectively therein;

a life time setting means in which a predetermined life time of each processing device is set out respectively; and

a means for generating an exchanging requirement signal for said processing device when said integrated working time


START
IS MOTOR ACTUATED ?
NO
YES
COUNTER USED FOR EXCHANGING REQUIREMENT FOR DEVELOPING UNIT IS INCREMENTED BY 1
PROCESS FOR EXCHANGING REQUIREMENT
COUNTER USED FOR EXCHANGING REQUIREMENT FOR DRUM UNIT IS INCREMENTED BY 1
PROCESS FOR EXCHANGING REQUIREMENT
COUNTER USED FOR EXCHANGING REQUIREMENT FOR FIXING UNIT IS INCREMENTED BY 1
PROCESS FOR EXCHANGING REQUIREMENT
COUNTER USED FOR EXCHANGING REQUIREMENT FOR TRANSFERING UNIT IS INCREMENTED BY 1
PROCESS FOR EXCHANGING REQUIREMENT
IS ANY OF EXCHANGING REQUIREMENT GENERATED?
DISPLAY EXCHANGING REQUIREMENT STORED IS NON-VOLATILE MEMORY RAM
1sec WAIT

thereof reaches said life time of said processing device, set out in said life time setting means.

5,066,979

COLOR IMAGE FORMING APPARATUS WHEREIN PLURAL COLORS CAN BE FORMED THROUGH ONE PRINTING CYCLE

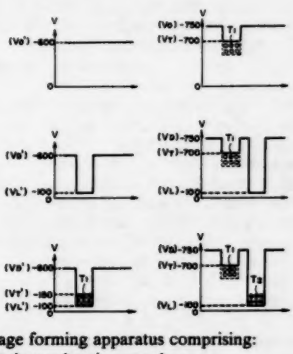
Masahiro Goto, Kawasaki; Takahiro Inoue, Yokohama; Junichi Kato, Sagamihara, and Tatsuya Kobayashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1990, Ser. No. 463,443

Claims priority, application Japan, Jan. 13, 1989, 1-004760; May 9, 1989, 1-115532

Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—208 **28 Claims**



1. An image forming apparatus comprising:

a movable image bearing member;

latent image forming means for forming first and second electrostatic latent images on said image bearing member;

first developing mean for forming a first visualized image by developing the first electrostatic latent image;

second developing means for providing a second visualized image by developing the second electrostatic latent image, wherein said second developing means acts on said image bearing member after the first visualized image is formed on said image bearing member, and wherein said second developing means includes developer carrying means for carrying a developer to a developing position where the developer is supplied to said image bearing member;

means for applying a vibratory voltage to said developer carrying means of said second developing means; and

control means for changing a duty ratio of the vibratory voltage,

wherein the vibratory voltage has a first peak for forming an electric field to urge the developer away from said developing carrying means toward said image bearing member and a second peak for forming an electric field to urge the developer away from said image bearing member toward said developer carrying means,

wherein the first peak and second peak are alternately applied, wherein said control means changes a duty ratio while maintaining the second peak substantially constant, and

wherein said control means changes the duty ratio by changing the first peak.

5,066,980

SOLENOID PLUNGER MAGNET AND ITS USE AS PRINT HAMMER IN A PRINT HAMMER DEVICE

Horst Schweizer, Wangerland, Fed. Rep. of Germany, assignor to AEG Olympia Office GmbH, Wilhelmshaven, Fed. Rep. of Germany

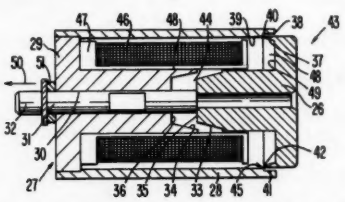
PCT No. PCT/DE89/00542, § 371 Date Apr. 30, 1990, § 102(e) Date Apr. 30, 1990, PCT Pub. No. WO90/03037, PCT Pub. Date Mar. 22, 1990

PCT Filed Aug. 19, 1989, Ser. No. 478,007

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829676

Int. Cl.[5] H10F *3/00, 7/08*

U.S. Cl. 335—255 **16 Claims**



1. A solenoid plunger magnet comprising an excitation coil, a solenoid plunger partially projecting into this coil and a yoke of a high permeability material configured to serve as a flux guiding means for forming, together with the solenoid plunger, a path of magnetic flux for the magnetic field generated by the excitation coil, the magnet further being provided with a central recess for guiding a non-magnetic guide member along the plunger, with a first air gap being provided within the coil, when the solenoid plunger is in its starting position, and a second air gap outside the coil between a face of the solenoid plunger and a respectively adjacent, correspondingly configured counter-face of the yoke, characterized in that the faces facing the air gaps at the solenoid plunger and counter-faces of the yoke are configured in such a manner that at least one of the two air gaps is cylindrical and has an external cone control; and that the magnetic flux in both air gaps is utilized for conversion into the desired motion force component for the solenoid plunger, the faces facing the outer air gap are cylindrical, with the plunger being provided with a cavity within the cylindrical exterior face, and when seen in the direction opposite to the direction of movement of the solenoid plunger, the inner circumferential face of the cavity extends conically toward the coil axis from the outer edge to the bottom face of the cavity when the coil is excited so as to form an external cone control, and the outer and inner circumferential faces forming the outer air gap are provided with edges configured as regions of denser magnetic flux in order to augment the thrust of the plunger.

5,066,981

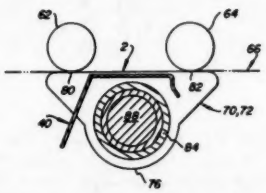
MECHANISM FOR RESPONSIVELY SPACING A DEVELOPMENT ROLLER

Satyan R. Kalyandurg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 15, 1990, Ser. No. 597,137

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—245 **8 Claims**



1. In an electrostatographic copier or printer having a flexible image-bearing member or film for electrostatically forming latent images on a frontside thereof, and a development apparatus positioned adjacent the frontside of the film and including a development roller for developing such latent images with toner particles, a spacing mechanism for responsively and precisely spacing the development roller from such frontside of the film, the spacing mechanism including:

(a) first and second backup rollers or ski rods for forming a film plane generally parallel to a tangential plane to the development roller, said first and second ski rods being mounted spaced side-by-side from each other in contact with a backside of the film, and across from the development roller or the development apparatus;

(b) spring means connected to a frame of the copier or printer for supporting the development apparatus urgeably toward or away from the frontside of the film; and

(c) a pair of generally triangular members, precisely spacing the development roller from said first and second ski rods, each said triangular members being mounted at an end of said development roller, and each said triangular members, as mounted, acting against a force of said spring means and simultaneously contacting said first and second ski rods, for moving said development roller responsively to any movement of said first and second ski rods and, hence, responsively to movement of the frontside of the film or image-bearing member.

5,066,982

CLEANER-LESS IMAGE FORMING APPARATUS

Masahiro Hosoya, Okegawa; Mitsunaga Saito, Tokyo; Shuitsu Sato, Kawasaki; Yoshimitsu Ohtaka, Mishima; Mitsuharu Endo, Susono, and Yukio Futamata, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa and Tokyo Electric Co., Ltd., Tokyo, both of, Japan

Filed Mar. 30, 1990, Ser. No. 501,864

Claims priority, application Japan, Mar. 31, 1989, 1-081921; Oct. 13, 1989, 1-266815

Int. Cl.[5] G03G *15/06, 15/24*

U.S. Cl. 355—269 **21 Claims**

1. An image forming apparatus comprising:

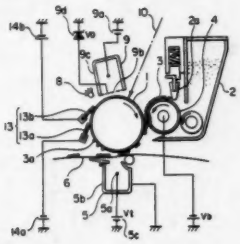
an electrostatic latent image holding member;

means for forming a latent image on said electrostatic latent image holding member;

a development unit for supplying and adhering toner on the latent image being formed so as to develop the latent image;

a transfer unit for transferring the latent image on an image holding material; and

residual toner image equalization means for equalizing the distribution of a residual toner image which stays on said electrostatic latent image holding member after said latent image is transferred, wherein



said development unit develops said latent image held on said electrostatic latent image holding member while attracting and collecting residual toner which remains on said electrostatic latent image holding member,

said residual toner image equalization means comprising a plurality of electrode members which are contactably and approachably disposed to said electrostatic latent image holding member.

5,066,983

CLEANING UNIT FOR CLEANING RECORDING MEDIUM OF AN ELECTROPHOTOGRAPHIC APPARATUS

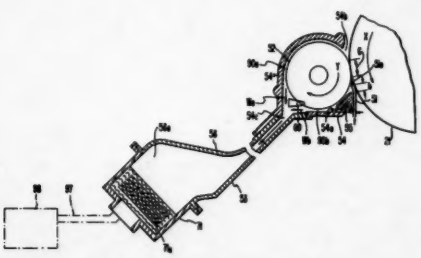
Yoshihiro Tonomoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 284,101, Dec. 14, 1988, Pat. No. 4,984,028. This application May 24, 1990, Ser. No. 527,836

Claims priority, application Japan, Dec. 18, 1987, 62-318637

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—297 **10 Claims**



1. An image forming apparatus comprising:

a rotatable image bearing member for forming a toner image;

a toner image transfer means disposed adjacent to said image bearing member for transferring said toner image to a printing medium; and

a cleaning unit disposed downstream from said toner image transfer means with respect to the rotation of said image bearing member, for cleaning said image bearing member after image transfer, said cleaning unit comprising:

a blade having an upwardly directed cleaning edge in contact with a downwardly moving portion of said image bearing member for scraping said image bearing member to remove contaminants thereon as said image bearing member rotates;

rotatable cleaning means disposed immediately upstream from said blade without contacting said blade and in engagement with said image bearing member for removing an outer portion of a pile of contaminants remaining thereon adjacent to said cleaning edge and accumulated directly in front of said cleaning edge as said image bearing member rotates, whereby larger particles of contaminants at an outer portion of said pile are continuously removed and smaller remaining particles of contaminants serve to lubricate the area between said blade and said image bearing member.

5,066,984

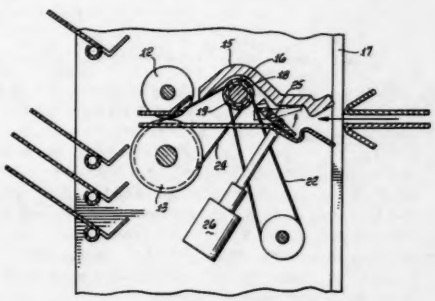
DECURLER

Peter M. Coombs, Tustin, Calif., assignor to Gradco Systems, Inc., Irvine, Calif.

Filed Nov. 17, 1987, Ser. No. 122,145

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—309 **2 Claims**



1. A device for removing curl from sheets of paper exiting a printing machine comprising: means for decurling sheets including a rotary driven sheets of feed shaft having a paper drive roll thereon and an arched guide member extending partially about said drive roll in closely spaced relation to the outer periphery of said drive roll and forming an arcuate gap exceeding the thickness of the sheets of to longitudinally deform the sheet between said roll and said guide and causing drive friction between said roll and the sheets of, and means for rotating said shaft.

5,066,985

COLOR CORRECTED IMAGE RECORDING APPARATUS USING YELLOW, MAGENTA AND CYAN LIQUID TONERS

Motoaki Yamanashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 22, 1990, Ser. No. 497,208

Claims priority, application Japan, Mar. 22, 1989, 1-69856

Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—326 **7 Claims**

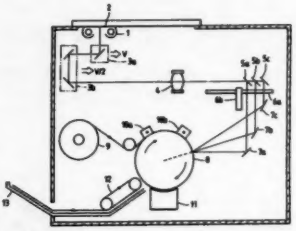
1. A color image recording apparatus for recording a color image of an original document on a photosensitive paper using at least yellow, magenta and cyan liquid toners respectively containing yellow, magenta and cyan color materials as primary color components, at least one of the three liquid toners further containing the primary color components of the rest of two liquid toners as foreign color components, wherein the color image recording is separately and sequentially performed with respect to the yellow, magenta and cyan liquid toners, and wherein each time one of the liquid toners is used, the photosensitive paper is exposed to light to form a latent image thereon corresponding to the color image of the original document, the apparatus comprising:

scanning means for scanning the color image of the original document and providing an imaging light;

charging means for uniformly charging the photosensitive paper;

light separation means for separating the imaging light into blue, green and red light components;

filter means for receiving the blue, green and red light components and changing light transmission rates passing through said filter means so as to be equal to a proportion of that color material to be used for reproduction which is contained in the yellow, magenta and cyan liquid toners, the light transmission rates being changed each time when one of the yellow, magenta and cyan liquid toners is used;



an optical unit for applying the blue, green and red light components passed through said filter means onto the photosensitive paper to form a latent image thereon corresponding to the color image of the original document, light paths of the blue, green and red light components being the same length, the blue, green and red light components passed through said filter means being focused on the same point on the photosensitive paper; and

developing means for developing the latent image with the liquid toner containing the color material to be reproduced as the main color component.

5,066,986

IMAGE RECORDING SYSTEM FOR CONTROLLING DEVELOPING DEVICES

Kiyoshi Emori, and Hiroshi Maekawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 1, 1989, Ser. No. 304,610

Claims priority, application Japan, Feb. 3, 1988, 63-24504

Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—326 **5 Claims**

1. A printer apparatus connected to a host means for forming images which comprises:

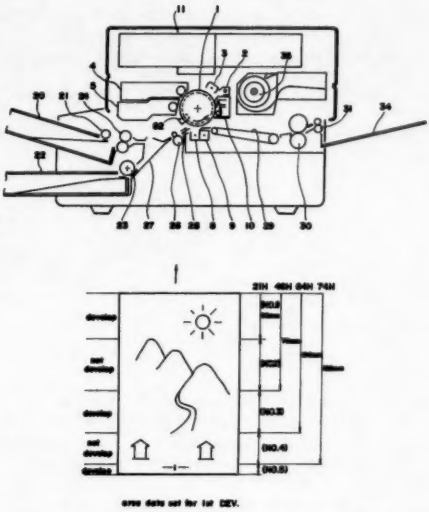
a photosensitive member;

an image forming means for forming an electrostatic latent image on the surface of said photosensitive member;

a plurality of developing devices, respectively containing different colors of developer, each of which is driven independently of one another and is selectively driven to develop the electrostatic latent image formed on the surface of the photosensitive member;

an image transfer means for transferring the developed image to a record medium; and

control means for controlling driving of said plurality of developing devices in a plurality of different modes during the development of the electrostatic latent image, in which only one of said developing device is driven to develop a first part of the electrostatic latent image in a first mode, at least two developing devices are driven to develop a second part of the electrostatic latent image in a second mode, and all of the developing devices are maintanined deenergized to prevent the development of a third



part of the electrostatic latent image in a third mode, said control means using at least two of said three modes.

5,066,987

SHADING BOARD FOR COPYING APPARATUS

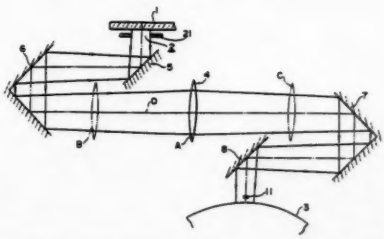
Nobutaka Minefuji, Fujimi, and Yasunori Arai, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1989, Ser. No. 450,468

Claims priority, application Japan, Dec. 19, 1988, 63-319905

Int. Cl.[5] G03G *15/04;* **G03B** *27/50*

U.S. Cl. 355—233 **7 Claims**



1. An electrophotographic copying apparatus wherein light reflected from an original subject is directed to a light receiving means through slit, which comprises:

optical means provided between said original subject and said light receiving means for varying the size of the reflected light being passed through said slit; and

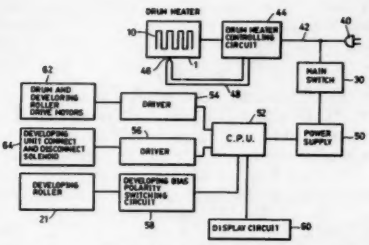
a shading member, positioned within the width of reflected light passing through said slit and fixed at a predetermined positioned between said optical means and said light receiving means along a longitudinal direction of said optical image.

5,066,988

ELECTROPHOTOGRAPHIC APPARATUS HAVING MEANS FOR AVOIDING BLURRING EFFECTS CAUSED BY IDLE INTERVALS

Nobuyuki Miyake, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1989, Ser. No. 405,238
Claims priority, application Japan, Sep. 30, 1988, 63-246311
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—245 7 Claims



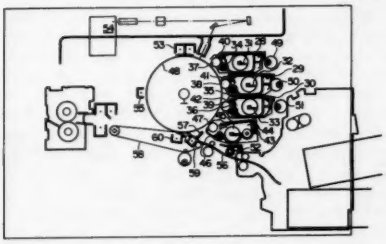
1. In an electrophotographic apparatus having a heater for heating a photosensitive body both when the apparatus is in operation and when the apparatus is not in operation, a main switch arranged to turn the apparatus on and off without turning the heater on or off, and a developing device including a developing roller for applying developer to the photosensitive body, and means for forcibly removing developer from said roller during an interval after said main switch is turned on and before a copying operation.

5,066,989

CLEANING METHOD FOR USE IN COPY APPARATUS AND TONER USED THEREFOR

Hajime Yamamoto, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 6, 1990, Ser. No. 578,279
Claims priority, application Japan, Sep. 26, 1989, 1-249531
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—270 5 Claims



1. A cleaning method for use in a color electrophotographic apparatus in which color toner images formed by using a plurality of color toners on a photosensitive medium by repeating charging, exposure and reversal developing steps are transferred to a sheet of paper at one stroke, the method comprising the steps of:

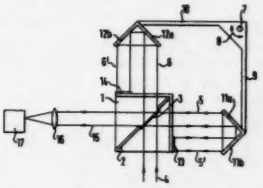
providing said toners including color toners and a black toner, each of said color toners being a toner for a DC electric field jump developing method which serves to develop without making contract with the photosensitive medium and said black toner being a toner for a two-component magnetic brush developer and being mixed with a carrier to be charged, and using said two-component brush developer as a cleaning agent serving to clean the toners remaining on the photosensitive medium after a transfer operation, said two-component brush developer being also used as a developer serving to develop in contract with the photosensitive medium.

5,066,990

REFLECTOR SYSTEM FOR MICHELSON INTERFEROMETERS

Harald Rippel, München, Fed. Rep. of Germany, assignor to Erwin Kayser - Threde GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 16, 1989, Ser. No. 437,198
Claims priority, application European Pat. Off., Nov. 17, 1988, 88119124.1
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—346 10 Claims



1. A reflector system for a Michelson interferometer, comprising:

a beam splitter arranged in a measurement beam path and having a partially transparent reflector for dividing a measurement light beam into first and second split beam paths;

first and second multi-reflecting arrangements respectively arranged in said first and second split beam paths for reflecting an incident light beam parallel to its incident beam path;

first and second mirrors respectively arranged in said parallel beam paths of said first and second multi-reflecting arrangement for reflecting light beam incident thereon back to said first and second multi-reflecting arrangements;

a movable two-arm pendulum for carrying said first and second multi-reflecting arrangements; and

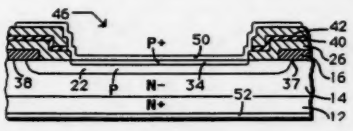
a carrier for carrying said beam splitter and said first and second mirrors, said carrier being formed of one unitary piece, wherein said one unitary piece comprises first and second perpendicular side walls, said beam splitter being mounted on a diagonal wall between planes of said first and second side walls, and said first and second mirrors being respectively mounted on said first and second side walls on surfaces opposite said beam splitter.

5,066,991

SEMICONDUCTOR DIODE AND METHOD

Kevin B. Jackson, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 456,913, Dec. 26, 1989, Pat. No. 4,978,636.
This application Aug. 20, 1990, Ser. No. 570,200
Int. Cl.[5] H01L *29/90, 21/94*
U.S. Cl. 357—13 3 Claims



1. A passivated diode comprising:

a substrate of a first conductivity type and with a lightly doped surface;

a first doped region of a second conductivity type opposite the first type in the substrate and extending to the surface and forming a PN junction with the substrate intersecting the surface; and

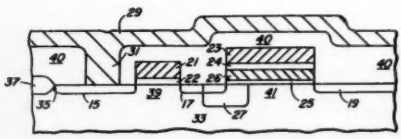
a passivation layer extending above the intersection of the PN junction with the surface, comprising, a thermal oxide against the surface, a first deposited oxide over the thermal oxide, a nitride over the first deposited oxide, and a second deposited oxide over the nitride.

5,066,992

PROGRAMMABLE AND ERASABLE MOS MEMORY DEVICE

Tsung-Ching Wu, San Jose, and Geeng-Chuan Chern, Cupertino, both of Calif., assignors to Atmel Corporation, San Jose, Calif.

Continuation of Ser. No. 370,731, Jun. 23, 1989, abandoned, which is a division of Ser. No. 332,879, Apr. 3, 1989, abandoned.
This application Oct. 29, 1990, Ser. No. 609,017
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.5 **4 Claims**



1. An electrically programmable and electrically erasable MOS memory device comprising,

a semiconductor substrate of a first conductivity type with at least one active memory area defined therein,

a field isolation oxide layer disposed on the substrate in all nonactive areas,

a plurality of implants of a second conductivity type extending to a first depth, having a first doping concentration and having edges spaced lengthwise apart in said active memory area, said implants defining first and second channels therebetween,

a program-and-erase implant of said second conductivity type extending to a second depth, greater than the first depth, and located in said active memory area, said program-and-erase implant overlapping one of said plurality of spaced apart implants in said active memory area and extending into said second channel,

a relatively thin oxide tunnel layer disposed over the entire second channel including over that portion of said program-and-erase implant which extends into said second channel,

a relatively thick oxide layer disposed over the entire first channel,

a polysilicon floating gate disposed over said thin oxide tunnel portion above said second channel, said floating gate having opposed edges, one of the edges aligned with one edge of two of said plurality of implants of the second conductivity type, said floating gate also covering said portion of said program-and-erase implant which extends into said second channel with said thin oxide tunnel portion therebetween, said thin oxide tunnel portion underlying the entire length of said floating gate,

a polysilicon select gate disposed over said relatively thick oxide layer above said first channel, thereby forming a select transistor,

a interpoly insulation layer of substantially uniform thickness disposed over said floating gate, and

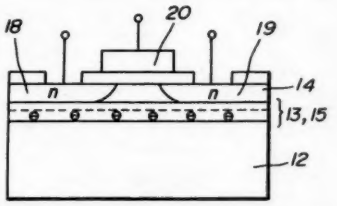
a control gate disposed over said interpoly insulative layer and capacitively coupling to said floating gate for enabling tunneling of charge carriers between said program-and-erase implant and said floating gate through said thin oxide tunnel portion.

5,066,993

SEMICONDUCTOR DEVICE HAVING SEMICONDUCTOR-ON-INSULATOR STRUCTURE

Takao Miura, Tokyo, and Kazunori Imaoka, Komae, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 7, 1989, Ser. No. 447,524
Claims priority, application Japan, Dec. 8, 1988, 63-310458
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 **8 Claims**



1. A semiconductor-on-insulator structure comprising:

a base substrate having a main surface;

an insulator layer at least on the main surface of said base substrate and having a top surface, said insulator layer including impurities therein establishing a first fixed charge in said insulator layer, said impurities having a predetermined density distribution relative to the distance from the top surface of the insulator layer and the top surface of the insulator layer having an impurity density which corresponds approximately to the maximum impurity density in the predetermined density distribution;

an active substrate of a semiconductor material and having a bottom surface bonded to and defining an interface with the top surface of the insulator layer, said active substrate having a second fixed charge at the interface of the insulator layer and said active substrate, said second fixed charge having a polarity opposite to that of said first fixed charge and a density corresponding to said maximum impurity density of said first charge; and

at least one semiconductor element formed in a region of said active substrate at least above the first fixed charge of said base substrate.

5,066,994

IMAGE SENSOR

Herbert J. Erhardt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

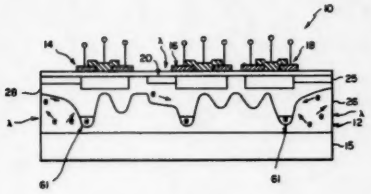
Filed Mar. 31, 1989, Ser. No. 331,156
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—24 **15 Claims**

1. An image sensor comprising:

a semiconductor substrate of a first conductivity type, said substrate having opposed major surfaces and opposed edges between said surfaces, one of said edges having a surface which is receptive to light;

an image sensor element formed in said substrate and located

adjacent said one edge, said image sensor element including a charge collection and transfer means and an image sensing region in which charge carriers are generated by light impinging on the surface of said one edge, said image sensor element further including means for creating a storage region in said substrate for receiving charge carri-



ers generated by light impinging on said edge surface and means for effecting the transfer of charge carriers from said storage region to said charge collection and transfer means; and

means in said substrate for guiding charge carriers in said image sensing region into said storage region.

5,066,995

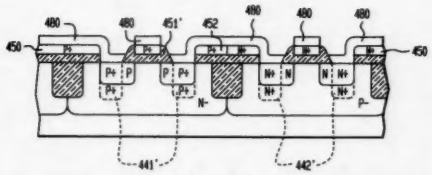
DOUBLE LEVEL CONDUCTOR STRUCTURE

William R. Young, and Anthony L. Rivoli, both of Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Mar. 13, 1987, Ser. No. 25,435

Int. Cl.[5] H01L *27/02, 29/04, 29/06*

U.S. Cl. 357—42 **5 Claims**



1. A complementary field effect transistor device comprising:

a silicon substrate having a sidewall isolating region defining a first and second isolated region on a first and second side of said sidewall isolating region respectively, wherein said first isolated region is of a first conductivity type, and said second isolated region is of a second conductivity type,

a dielectric layer covering portions of said first and second isolated regions,

a first semiconductor layer formed on said dielectric layer and, a second semiconductor layer formed on said first semiconductor layer and on said substrate, and wherein said second semiconductor layer has a first resistance to the passage of impurities therethrough, and said combined first and second semiconductor layers have a substantially greater resistance to the passage of impurities therethrough,

and wherein said first isolated region includes a source and a drain region of said second conductivity type and said second isolated region includes a source and a drain region of said first conductivity type, and

wherein a portion of said second semiconductor layer extends contiguously over said sidewall isolating region, and

further comprising drain extension regions which extend into said portion of said second semiconductor layer that extends contiguously over said sidewall isolating region.

5,066,996

CHANNELLESS GATE ARRAY WITH A SHARED BIPOLAR TRANSISTOR

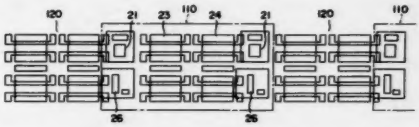
Hiroyuki Hara, Tokyo; Yasuhiro Sugimoto, and Tetsu Nagamatsu, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 311,256, Feb. 16, 1989, abandoned. This application Apr. 15, 1991, Ser. No. 684,513

Claims priority, application Japan, Feb. 19, 1988, 63-35171

Int. Cl.[5] H01L *27/02, 27/10*

U.S. Cl. 357—43 **5 Claims**



1. A semiconductor device having a channelless gate array, comprising:

a gate array chip; and

a plurality of standard cell rows disposed on said gate array chip such that no space exists between adjacent standard cell rows; each of said plurality of standard cell rows including a plurality of adjacent standard cells; each of said plurality of standard cells including a plurality of P-type and N-type MOS transistors, one bipolar transistor and one or more resistors; wherein said one bipolar transistor and said one or more resistors of each standard cell are shared by an adjacent standard cell to provide BiCMOS logic gates in each of said plurality of standard cell rows.

5,066,997

SEMICONDUCTOR DEVICE

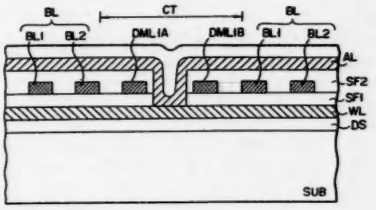
Kiyofumi Sakurai; Syuso Fujii, both of Kawasaki, and Mitsuru Shimizu, Sakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 15, 1989, Ser. No. 436,646

Claims priority, application Japan, Nov. 15, 1988, 63-288438

Int. Cl.[5] H01L *27/10, 27/15*

U.S. Cl. 357—45 **23 Claims**



1. A semiconductor device comprising:

a semiconductor chip in which a plurality of circuit elements having essentially the same structure are arranged in a regular manner;

a first insulating layer formed on the semiconductor chip;

a plurality of first wiring lines connected to said circuit elements grouped in pair and arranged in parallel formed on said first insulating layer with a first predetermined interval between each of said wiring lines in the same pair and a second predetermined interval between said pairs said plurality of first wiring lines formed substantially in a first plane;

a second insulating layer formed on the plurality of first wiring lines;

a plurality of second wiring lines formed on said second insulating layer and arranged in parallel third and fourth

predetermined intervals in a direction perpendicular to said first wiring lines, each of said second wiring lines having a plurality of segments extending through the first insulating layer, the first plane and the second insulating layer in the direction of said semiconductor chip at a plurality of first predetermined positions, said first predetermined positions being located within the second predetermined intervals; and

a plurality of first dummy wiring lines formed substantially in the first plane and in parallel with said first wiring lines, said first dummy wiring lines being arranged within said second predetermined interval such that a first dummy wiring line is between each first predetermined position and each pair of first wiring lines.

5,066,998

SEVERABLE CONDUCTIVE PATH IN AN INTEGRATED-CIRCUIT DEVICE

Frederick H. Fischer; Kuo-hua Lee, both of Lower Macungie Township, Lehigh County; William J. Nagy, Bethlehem, and Nur Selamoglu, Philadelphia, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 374,423, Jun. 30, 1989, abandoned. This application Aug. 20, 1990, Ser. No. 569,755

Int. Cl.[5] H01L *27/02, 23/48*

U.S. Cl. 357—51 **2 Claims**

1. An integrated circuit device comprising a conductive path which includes a programmable link,

said conductive path having: a uniform width, a bottom surface, a first top surface outside of said programmable link and a second top surface at said programmable link; and having a first thickness away from said programmable link and having a second thickness at said programmable link;

said first thickness being defined between a first reference plane said bottom surface and a second reference plane at said first top surface, and said second thickness being defined between said first reference plane and a third reference plane at said second top surface;

and said programmable link being of the same material as said conductive path.

5,066,999

RESISTOR UNDER WIREBOND PAD

Stephen L. Casper, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Oct. 23, 1989, Ser. No. 425,675

Int. Cl.[5] H01L *27/02*

U.S. Cl. 357—51 **12 Claims**

1. IC apparatus comprising:

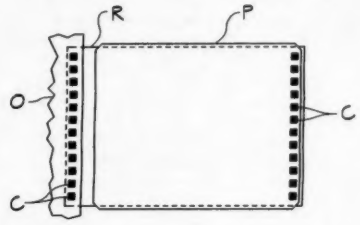
(a) a semiconductor substrate, having active circuitry formed thereon;

(b) a resistor including a layer of polysilicon disposed over said substrate;

(c) a wirebond pad, said wirebond pad being remote from said active circuitry;

(d) a first group of contacts, contacting said wirebond pad to said resistor; and

(e) a second group of contacts, contacting said resistor to other circuitry located on said substrate;



wherein said wirebond pad is disposed over a portion of said resistor.

5,067,000

SEMICONDUCTOR DEVICE HAVING FIELD SHIELD ISOLATION

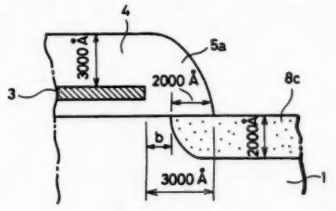
Takahisa Eimori; Shinichi Satoh; Wataru Wakamiya; Hiroji Ozaki, and Yoshinori Tanaka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

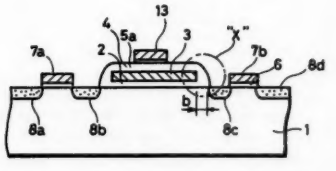
Filed Aug. 9, 1989, Ser. No. 391,008

Claims priority, application Japan, Sep. 29, 1988, 63-247672

Int. Cl.[5] H01L *29/40, 27/01, 29/10, 27/02*

U.S. Cl. 357—53 **13 Claims**





1. A semiconductor device for electrically isolating a first device from a second formed on a common substrate therewith, comprising:

a semiconductor substrate of a first conductivity type having a major surface,

a conductor formed over a region of the semiconductor substrate and separated therefrom by an insulating film, said conductor having a lateral dimension extending at least in a lateral direction over said region of said semiconductor substrate,

first and second impurity regions of a second conductivity type opposite to the first conductivity type, formed on opposite sides of said conductor at predetermined lateral spacing therefrom along the major surface of said semiconductor substrate, said lateral spacing being established by a lateral thickness of sidewalls of said insulating film extending from said opposite sides of said conductor, and

said first impurity region being included in said first device and said second impurity region being included in said second device,

further comprising an interlayer insulating film on said conductor, said interlayer insulating film having a predetermined vertical thickness,

wherein said lateral thickness of said sidewalls of said insulating film extending from said opposite sides of said conductor corresponds to said predetermined vertical thickness of said interlayer insulating film,

wherein said first and second impurity regions of said first and second devices are formed in said substrate and have a predetermined depth less than said predetermined thickness of said interlayer insulating film.

5,067,001

STRUCTURE AND METHOD FOR MANUFACTURING A SERIES READ ONLY MEMORY WITH SPACER FILM

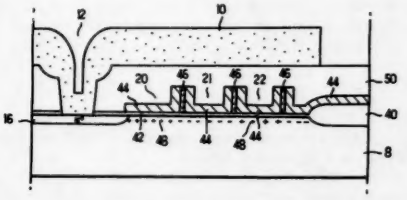
Jung-Hyuk Choi, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 359,125, May 31, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 607,760

Claims priority, application Rep. of Korea, May 5, 1989, 1989/6137[U]

Int. Cl.[5] H01L *29/34*

U.S. Cl. 357—54 **24 Claims**



21. A mask read only memory having a plurality of memory strings with a plurality of memory cells formed on a surface of a substrate of a first conduction type and connected between each of a plurality of contact regions of a second conduction type on the substrate and a reference region of the second conduction type, comprising:

gate oxide layers formed on the surface of said substrate on which said memory cells are formed;

channel regions having ions of the first conduction type under one of said memory cells adjacent to a connection region and oxide layers of a selected memory cell or cells;

channel regions having ions of the second conduction type under oxide layer or layers of a non-selected memory cell or cells;

a plurality of said channel regions being connected in series in each of said memory strings;

each of said memory strings having a plurality of spaced-apart side wall layers disposed over said channel regions, with each of said side wall layers in each of said memory strings being spaced-apart in an array disposed between said connection region and a reference region in order to isolate the memory cells in each of said memory strings; and

gate electrodes formed between side walls of the side wall layers and over each of said gate oxide layers and adjacent memory cells.

5,067,002

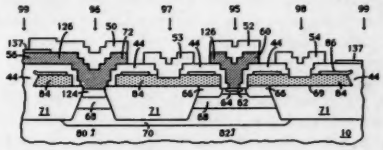
INTEGRATED CIRCUIT STRUCTURES HAVING POLYCRYSTALLINE ELECTRODE CONTACTS

Peter J. Zdebel, Mesa; Raymond J. Balda, Tempe; Bor-Yuan Hwang, Chandler, and Allen J. Wagner, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 9,322, Jan. 30, 1987, Pat. No. 4,837,176. This application Jan. 31, 1989, Ser. No. 304,984

Int. Cl.[5] H01L *29/04, 29/10, 27/02, 29/72*

U.S. Cl. 357—59 **20 Claims**



1. An electronic device comprising:

a semiconductor substrate having therein at least one region laterally enclosed by a dielectric isolation region and extending to a principal surface of said substrate;

a conductor layer on said substrate, having a first end extending onto a first portion of said dielectric isolation region and a second end extending onto a first portion of said one region;

an oxidation resistant layer on said conductor layer, having a third end extending beyond said first end of said conductor layer; and

a dielectric layer of a material different than said oxidation resistant layer having a first portion above said oxidation resistant layer, and a second portion above said isolation region, and a third portion surrounding said third end of said oxidation resistant layer.

5,067,003

SEMICUSTOM-MADE SEMICONDUCTOR INTEGRATED CIRCUIT HAVING INTERFACE CIRCUIT SELECTIVELY COUPLED TO DIFFERENT VOLTAGE SOURCE

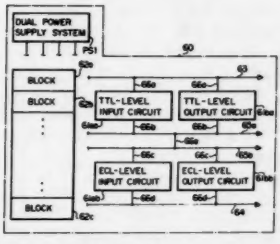
Hitoshi Okamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,910

Claims priority, application Japan, Sep. 25, 1989, 1-248534

Int. Cl.[5] H01L *23/48, 25/16*

U.S. Cl. 357—68 **15 Claims**



1. A semicustom-made semiconductor integrated circuit fabricated on a single semiconductor chip, comprising:

a) a first high level voltage line;

b) a first low level voltage line;

c) a first interface circuit coupled between said first high level voltage lie and said first low level voltage line;

d) a second high level voltage line;

e) a second low level voltage line, said first high and low level voltage lines and said second high and low level voltage lines extending substantially parallel and adjacent to one another;

f) a second interface circuit coupled between said second high level voltage line and said second low level voltage line; and

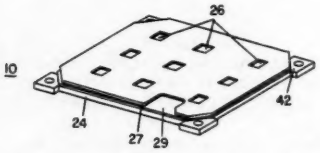
g) coupling means for alternatively coupling said first low level voltage line with said second high level voltage line and said first high and low level voltage lines with said second high and low level voltage lines, respectively, wherein said first high and low level voltage lines and said second high and low level voltage lines are coupled between either dual or single power supply system and said first and second interface circuits whereby coupling arrangements between said first and second high and low level voltage lines and said first interface circuit and between said second high and low level voltage lines and said second interface circuit in said dual power supply system being similar to coupling arrangements between said first high and low level voltage lines and said first interface circuit and between said second high and low level voltage lines and said second interface circuit in said single power supply system, said dual power supply system producing two power voltage levels different from each other, said single power supply system producing a single power voltage level.

5,067,004

MODULE FOR INTERCONNECTING INTEGRATED CIRCUITS

Donald E. Marshall, Harvard, Mass., and James B. McElroy, Cupertino, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 13, 1989, Ser. No. 450,219
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **16 Claims**



1. A signal carrying arrangement for an electronic circuit, comprising:

a thermally conductive base, having a top surface and a body constructed to provide a rigid platform to enhance planarity and minimize warping of the signal carrying arrangement;

a plurality of electronic circuit die, each having a bottom surface mounted over the top surface of and thermally coupled to the base, having leads for carrying signals;

a multilayered substrate having a bottom surface disposed adjacent the top surface of the base, electrical conductors in layers of the substrate for interconnecting the die and a plurality of apertures for receiving the respective die therein; and

an electrical connector arrangement to coupled signals between the leads of the electronic circuit die and the electrical conductors in the substrate.

5,067,005

SEMICONDUCTOR DEVICE

Kazunari Michii, and Masataka Takehara, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 571,127, Aug. 23, 1990, abandoned. This application Mar. 26, 1991, Ser. No. 675,040
Claims priority, application Japan, Aug. 28, 1989, 1-218660
Int. Cl.[5] H01L *23/28*
U.S. Cl. 357—72 **10 Claims**

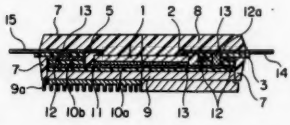
1. A resin-packaged semiconductor device comprising:

a semiconductor element having obverse and reverse surfaces and a plurality of electrodes on said obverse surface;

an insulating tape peripherally disposed around said semiconductor element and having obverse and reverse surfaces;

a plurality of leads, each having inner and outer ends and including a power supply lead, a grounding lead, and signal line leads, fixed to said obverse surface of said insulating tape, said leads being connected at their inner ends to respective electrodes, the outer ends of said leads extending beyond said insulating tape;

capacitive circuit means on which said semiconductor element, said insulating tape, and said plurality of leads are mounted, said capacitive circuit means including first and second electrically conductive plates respectively electri-



cally connected to at least one of said plurality of leads and said semiconductor element, and first and second insulating layers, said second insulating layer being disposed between said electrically conductive plates to form a decoupling capacitor, said reverse surface of said semiconductor element being disposed on said first insulating layer;

a heat radiating layer disposed on said first insulating layer opposite said semiconductive element for radiating heat generated in the semiconductor device; and

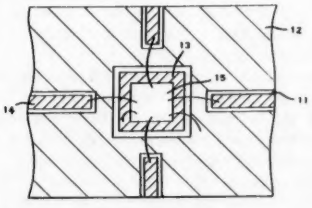
a resin encapsulating said semiconductor element, said first and second conductive plates, and said first and second insulating layers, the outer end portions of said leads extending from the resin and at least part of said heat radiating layer not being encapsulated by said resin.

5,067,006

SEMICONDUCTOR DEVICE

Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 15, 1990, Ser. No. 567,814
Claims priority, application Japan, Aug. 28, 1989, 1-220847
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—74 **3 Claims**



1. A semiconductor device comprising:

an insulating substrate;

a first conducting pattern and a second conducting patter formed on said substrate, said first conducting pattern and said second conducting pattern being electrically insulated from each other and said second conducting pattern being connected to ground; and

a semiconductor chip having (a) a reception circuit formed therein, said reception circuit including a capacitor, and (b) a metal film formed on a back surface of said chip, said chip being die-bonded on said first conducting pattern, said capacitor being formed in said chip and including a first terminal and a second terminal, one of said first termi-

nal and said second terminal being electrically connected to said first conducting pattern, whereby an electrical potential of said capacitor is transmitted to said metal film.

5,067,007

SEMICONDUCTOR DEVICE HAVING LEADS FOR MOUNTING TO A SURFACE OF A PRINTED CIRCUIT BOARD

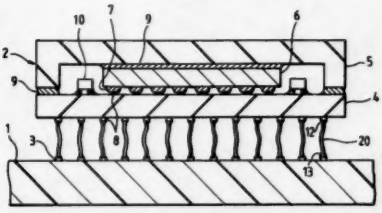
Otsuka Kanji, Higashiyamato; Kato Masao, Hadano; Kumagai Takashi, Isehara; Usami Mitsuo; Kuroda Shigeo, both of Ohme; Sahara Kunizo, Nishitama; Yamada Takeo, Koganei; Miyamoto Seiji, Fuchuu; Shirai Yuuji, Kodaira; Okinaga Takayuki, Akishima; Kubo Kazutoshi, Akishima; Tachi Hiroshi, Akishima, and Kawashima Masayuki, Higashimurayama, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Continuation of Ser. No. 363,750, Jun. 9, 1989, abandoned. This application Jan. 24, 1991, Ser. No. 645,357

Claims priority, application Japan, Jun. 13, 1988, 63-145203

Int. Cl.[5] H01L *23/12, 21/60*

U.S. Cl. 357—74 11 Claims



1. A semiconductor device having leads for mounting to a printed circuit board surface, comprising:

an insulating substrate having a plurality of first electrodes arranged on one side of said substrate, said first electrodes being electrically connected to the other side of said substrate by internal wirings;

a semiconductor chip having integrated circuits and external terminals formed on one surface of said chip, said chip mounted to said other side of said substrate so that said external terminals are electrically connected to said first electrodes by said internal wirings;

said leads having first and second connecting junctions, said first connecting junctions connecting to said first electrodes, and said leads extending substantially perpendicular to said substrate; and

a plurality of second electrodes arranged on one side of said printed circuit board surface, said second connecting junctions mounted to said second electrodes of said circuit board surface to electrically connect said external terminals of said chip to said second electrodes,

wherein said leads have a deformation strength that is smaller than the junction strength at each connecting junction of the leads and the electrodes, said leads comprising any one of tungsten, molybdenum, carbon amorphous metal, or bundles of composite fine wires; pseudo elastic material consisting any of Ti-Ni, Ag-Cd, Cu-Al-Ni, Ti-Ni-Fe alloy; ultra-high tension material a heat resistant ultra-high tension material.

5,067,008

IC PACKAGE AND IC CARD INCORPORATING THE SAME THEREINTO

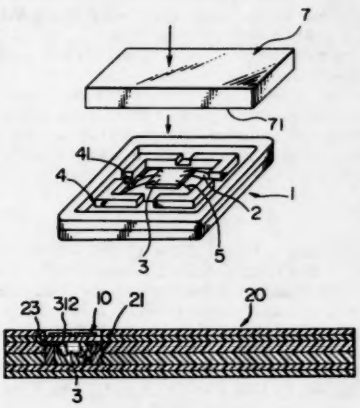
Yoshimi Yanaka, Toride, and Keiji Miyamoto, Ibaraki, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 7, 1990, Ser. No. 563,628

Claims priority, application Japan, Aug. 11, 1989, 1-209360

Int. Cl.[5] H01L *23/02*

U.S. Cl. 357—81 13 Claims



1. An IC package comprising:

an integrated circuit chip;

a substrate on which said integrated circuit chip is mounted;

a wall for surrounding said integrated circuit chip provided on said substrate to define therebetween a cavity;

recess means provided in said surrounding wall for communicating with said cavity; and

resin for filling said cavity and said recess means for sealing said integrated circuit chip.

5,067,009

APPARATUS FOR RECORDING AND/OR REPRODUCING A COMPONENT VIDEO SIGNAL HAVING A LUMINANCE SIGNAL OF A WIDE FREQUENCY BAND AND A CHROMA SIGNAL IN A BAND BELOW THE HIGH END OF THE LUMINANCE SIGNAL BAND AND WITHIN THE LATTER

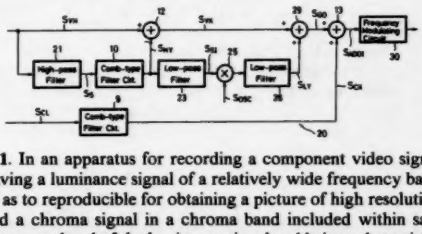
Shigeru Ganse, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,768

Claims priority, application Japan, Apr. 6, 1989, 1-88317

Int. Cl.[5] H04N *9/85*

U.S. Cl. 358—12 17 Claims



1. In an apparatus for recording a component video signal having a luminance signal of a relatively wide frequency band so as to reproducible for obtaining a picture of high resolution and a chroma signal in a chroma band included within said frequency band of the luminance signal and being substantially below the high end thereof, a signal processing circuit comprising:

means receiving said luminance signal for separating there-

from a slant direction luminance signal formed of slant direction luminance information in a frequency band that includes and extends substantially above said chroma band;

means for suppressing said luminance signal by said slant direction luminance signal so as to obtain a suppressed luminance signal;

frequency-converting means for frequency-converting a component of said slant direction luminance signal in said chroma band to a frequency-converted slant direction luminance signal which is frequency interleaved with said suppressed luminance signal and which is in a frequency band higher than said chroma band;

means for frequency interleaving said chroma signal with said suppressed luminance signal; and

means for adding said suppressed luminance signal, said frequency-converted slant direction luminance signal and said chroma signal interleaved with the suppressed luminance signal so as to provide an added signal to be recorded.

5,067,010

COLOR VIDEO SIGNAL PROCESSING DEVICE WITH ENCODING AND COMPRESSION

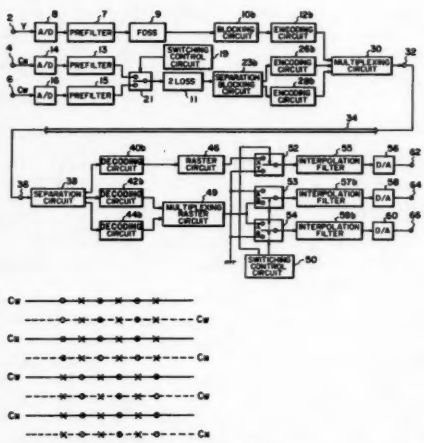
Yoshiki Ishii, Hadano, and Makoto Shimokoriyama, Zama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,196

Claims priority, application Japan, Apr. 11, 1988, 63-90105; Apr. 11, 1988, 63-90106; Apr. 11, 1988, 63-90107; Apr. 11, 1988, 63-90108; Apr. 12, 1988, 63-89539; Apr. 13, 1988, 63-90799

Int. Cl.[5] H04N *11/04*

U.S. Cl. 358—13 **21 Claims**



1. A color video signal processing device comprising:

(a) color subsampling means for thinning out pixels for a whole picture plane with respect to each of two kinds of digital color difference signals in accordance with a predetermined rule, said color subsampling means executing a field offset subsampling;

(b) color blocking means for forming color blocks each consisting of (n×m) pixels (n and m being integers not less than 2) with respect to each of the two kinds of color difference signals whose pixels were thinned out by said subsampling means; and

(c) color encoding means for encoding and compressing each of the two kinds of color difference signals whose pixels are thinned out by said subsampling means and divided into said color blocks by said color blocking means, color block by color block.

5,067,011

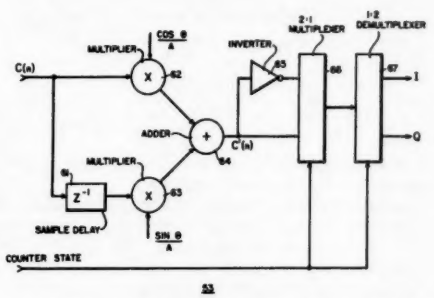
METHOD AND APPARATUS FOR DEMODULATING CHROMINANCE SIGNALS USING A TRAINING SIGNAL IN PLACE OF A COLOR BURST SIGNAL

Carlo Basile, Flushing; Alan P. Cavallerano, Ossining, and Mikhail Tsinberg, Riverdale, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 346,323, May 1, 1989, Pat. No. 4,947,241, which is a continuation of Ser. No. 224,203, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 57,880, Jun. 2, 1987, abandoned. This application Jun. 27, 1990, Ser. No. 545,329

Int. Cl.[5] H04N *9/66*

U.S. Cl. 358—23 **6 Claims**



2. A television receiver comprising apparatus for demodulation chrominance signals present in a conventional television signal transmitted over a transmission path, said television signal comprising a training signal having a place of a conventional color burst signal, a color subcarrier portion occurring during the vertical blanking intervals of said television signal, said apparatus comprising:

reference means for providing a reference signal corresponding to said training signal as transmitted;

means for sampling said training signal from said television signal thereby providing a second signal which represents said training signal as received over said transmission path;

means coupled to said sampling means for processing said second signal with respect to said reference signal so as to generate a plurality of coefficients comprising $\sin\theta/A$ and $\cos\theta/A$, whereθ is represents the phase difference between said second signal and a sampling signal and A represents the gain of the transmission path; and

means coupled to said processing means, for utilizing said coefficients to demodulate said chrominance signals.

5,067,012

METHODS AND SYSTEMS FOR SCANNING AND INSPECTING IMAGES

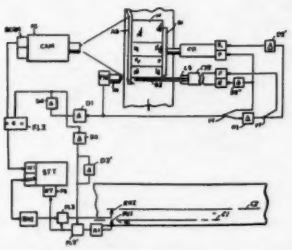
Jerome H. Lemelson, 48 Parkside Dr., Princeton, N.J. 08540

Continuation of Ser. No. 906,969, Sep. 15, 1986, which is a continuation of Ser. No. 723,183, Apr. 15, 1985, Pat. No. 4,660,086, which is a continuation of Ser. No. 394,946, Jul. 2, 1982, Pat. No. 4,511,918, which is a division of Ser. No. 13,608, Feb. 16, 1979, Pat. No. 4,338,626, which is a division of Ser. No. 778,331, Mar. 16, 1977, Pat. No. 4,148,061, which is a continuation of Ser. No. 254,710, May 18, 1972, Pat. No. 4,118,730, which is a continuation-in-part of Ser. No. 267,377, Mar. 11, 1963, abandoned, which is a continuation-in-part of Ser. No. 626,211, Dec. 4, 1956, Pat. No. 3,801,379, and a continuation-in-part of Ser. No. 477,467, Dec. 24, 1954, abandoned. This application Mar. 27, 1990, Ser. No. 500,287

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.[5] H06N *7/18*

U.S. Cl. 358—93 8 Claims



1. An automatic inspection apparatus comprising:

(a) means for positioning an object to be inspected at an inspection work station;

(b) electronic scanning means disposed at the work station for examining the object under inspection;

(c) said scanning means including means for generating analog information signals that are representative of variations in the physical characteristics of the object under inspection;

(d) means for effecting relative movement between the object under inspection and the electronic scanning means so as to present different portions of the object in the field scanned by the scanning means; and

(e) electronic circuit means for analyzing the information content of the analog information signals generated by the electronic scanning means.

5,067,013

PROCEDURE AND APPARATUS FOR LOCATING A CONTAINER FOR LIFTING

Mikko Lindholm, and Pentti Vähä, both of Oulu, Finland, assignors to Kone OY, Helsinki, Finland

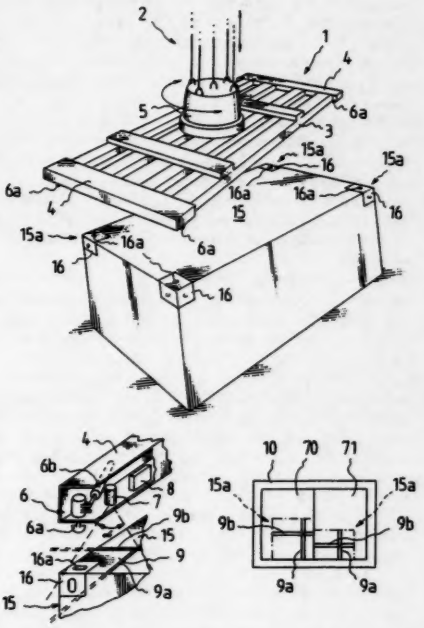
Filed Dec. 7, 1990, Ser. No. 623,767

Claims priority, application Finland, Dec. 8, 1989, 895892

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—93 11 Claims

1. Procedure for locating a container to enable the loading device of a container crane, or an equivalent container handling apparatus, to be moved into position for interlocking means of graspers of the loading device to be engaged with corner pieces of the container so as to allow the container to be lifted; wherein the area below the loading device is observed by means of video devices placed in the vicinity of at least two of the interlocking means such that, based on the video data obtained from each video device, the edges and/or corner pieces of the container are recognized, and, by the aid of video information derived from said video data, the loading device is brought into the correct position in relation to the container so



that the interlocking means of the graspers can be fastened to the corner pieces of the container.

5,067,014

THREE-FRAME TECHNIQUE FOR ANALYZING TWO MOTIONS IN SUCCESSIVE IMAGE FRAMES DYNAMICALLY

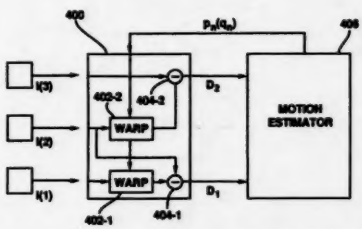
James R. Bergen, Hopewell Township, Mercer County; Peter J. Burt, Princeton Township, Mercer County; Rajesh Hingorani, Plainsboro Township, Middlesex County, all of N.J., and Shmuel Peleg, Jerusalem, Israel, assignors to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Dec. 13, 1990, Ser. No. 624,343

Claims priority, application United Kingdom, Jan. 23, 1990, 9001468

Int. Cl.[5] G06K *9/36*

U.S. Cl. 358—105 18 Claims



1. A feedback loop for iteratively motion-processing image-data pixels within respective analysis regions of a first-occurring frame, a second-occurring frame, and a third-occurring frame of a motion-picture during each of successive cycles of

operation thereof; wherein the image-data pixels within said analysis regions of these motion-picture frames may define first and second differently-moving patterns; said feedback loop comprising:

first warp means for shifting the position of said first of said moving patterns within said first-occurring frame analysis region toward the position of said first of said moving patterns within said second-occurring frame analysis region by an amount determined by the value of a warp-control signal applied to said first warp means during any odd cycle of iterative operation of said feedback loop;

second warp means for shifting the position of said first of said moving patterns within said second-occurring frame analysis region toward the position of said first of said moving patterns within said third-occurring frame analysis region by an amount determined by the value of said warp-control signal applied to said second warp means during that odd cycle of iterative operation of said feedback loop;

first computation means coupled to said first warp means for performing a predetermined computation on corresponding image-data pixel values of said second-occurring frame and said shifted-pattern first-occurring frame for deriving first computation image data;

second computation means coupled to said second warp means for performing said predetermined computation on corresponding image-data pixel values of said third-occurring frame and said shifted-pattern second-occurring frame for deriving second computation image data; and

motion estimation means, responsive to both said first and said second computation image data derived during that odd cycle of iterative operation, for computing a first warp-control-signal value for application to said first and second warp means during the immediately following even cycle of iterative operation, which first computed value results in the position of said second of said moving patterns within said respective first-occurring and second-occurring frame analysis regions being shifted toward the position of said second of said moving patterns within said respective second-occurring and third-occurring frame analysis regions by an amount determined by said first computed value.

5,067,015

METHOD OF PROCESSING VIDEO IMAGE DATA FOR USE IN THE STORAGE OR TRANSMISSION OF MOVING DIGITAL IMAGES

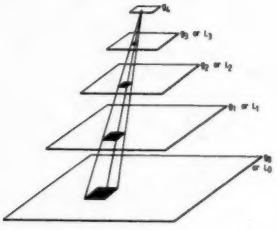
Brian L. Combridge; David Robson, and Daniel R. E. Timson, all of Stevenage, United Kingdom, assignors to British Aerospace Public Limited Company, London, England

Filed Jun. 18, 1990, Ser. No. 539,814

Claims priority, application United Kingdom, Jun. 28, 1989, 8914843

Int. Cl.[5] H04N *7/13*

U.S. Cl. 358—133 **15 Claims**



1. A method of processing video image data for use in the storage or transmission of moving digital video images, comprising the steps of:

decomposing each frame image into an equivalent set of sub-images containing information on different length scales,

deriving encoded prediction rules from the sub-images decomposed in said decomposing step;

approximating each sub-image using data from the immediately preceding compressed sub-image and data from the current sub-image to produce compressed data of an image for subsequent storage or transmission to a receiver; and

reconstructing de-compressed current frame data, after retrieval or receipt, by comparison of the compressed data received for the current frame image with a reconstruction of the preceding frame image.

5,067,016

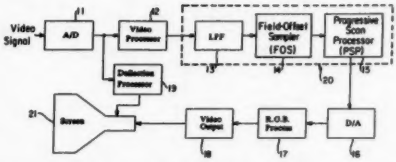
PROGRESSIVE SCAN SYSTEM WITH FIELD-OFFSET SAMPLING

Jinn-Shyan Wang, Hsin-Chu, China, assignor to Industrial Technology Research Institute, Taiwan

Filed Mar. 7, 1990, Ser. No. 489,808

Int. Cl.[5] H04N *7/01, 7/18, 7/12, 11/06*

U.S. Cl. 358—140 **8 Claims**



1. A method for generating non-interlaced video signals for displaying a picture having a higher displayed line-rate than the combined rate of the fields of a standard interlaced incoming video signal, comprising the steps of:

sub-sampling the incoming interlaced video signal so that the signal in the first field is sub-sampled with diagonal offset with respect to that in the second field;

generating interpolated line signals from said subsampled interlaced signal; and

using the higher displayed line-rate, interposing, with diagonal offset, each interpolated line signal generated between two adjacent sub-sampled interlaced line signals.

5,067,017

COMPATIBLE AND SPECTRUM EFFICIENT HIGH DEFINITION TELEVISION

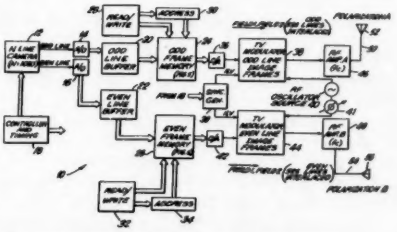
Leo Zucker, 2591 Dunning Dr., Yorktown Heights, N.Y. 10598

Continuation-in-part of Ser. No. 303,917, Jan. 30, 1989, Pat. No. 4,905,084. This application Feb. 13, 1990, Ser. No. 479,340

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] H04N *17/04, 11/06, 5/44, 7/08*

U.S. Cl. 358—141 **24 Claims**



1. Television transmitting apparatus, comprising:

image source means for generating image line signals corre-

sponding to an image frame having a resolution of N scan lines, wherein successive lines n comprising the image frame are consecutively numbered from n = 1 to N;

first modulator means coupled to the image source means for modulating image line signals corresponding to odd numbered lines of the image frame on a first radio frequency (RF) carrier wave signal of a certain phase to produce corresponding odd line image signals;

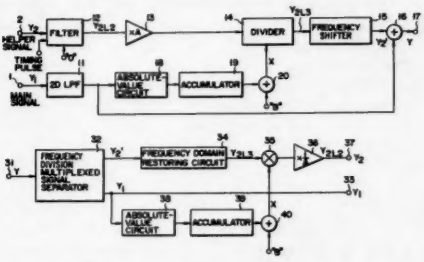
second modulator means coupled to the image source means for modulating image line signals corresponding to even numbered lines of the image frame on a second RF carrier wave signal of a certain phase to produce corresponding even line image signals; and

control means coupled to the image source means for causing the image source means to supply the image line signals to the first and the second modulator means so that corresponding portions of the image line signals are modulated on said carrier wave signals simultaneously with one another by both of said first and said second modulator means.

5,067,018
FREQUENCY-DIVISION MULTIPLEXING ARRANGEMENT FOR PREVENTING INTERFERENCE BETWEEN A MAIN TELEVISION SIGNAL AND A HELPER SIGNAL THEREOF

Noriya Sakamoto; Seijiro Yasuki, both of Yokohama, and Kiyoyuki Kawai, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 1, 1990, Ser. No. 531,745
Claims priority, application Japan, Jun. 7, 1989, 1-144947
Int. Cl.[5] H04N *7/04*
U.S. Cl. 358—142 **14 Claims**



1. A multiplexed signal transmitter comprising:

energy detecting means for detecting energy of a plurality of pixels of a main signal as a television signal;

level control means for controlling a level of a helper signal having a correlation with said main signal, based on a detection output of said energy detecting means; and

frequency-division multiplexing means for frequency-division multiplexing said helper signal having its level controlled by said level control means, with said main signal.

5,067,019
PROGRAMMABLE REMAPPER FOR IMAGE PROCESSING

Richard D. Juday, Houston, and Jeffrey B. Sampsell, Plano, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1989, Ser. No. 331,551
Int. Cl.[5] H04N *5/262*
U.S. Cl. 358—160 **16 Claims**

1. An image processing system comprising

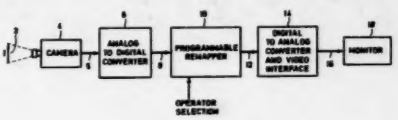
means for converting an image into a plurality of representative input pixels, said input pixels arranged in a first Cartesian matrix of i columns and j rows, each input pixel including a pixel value,

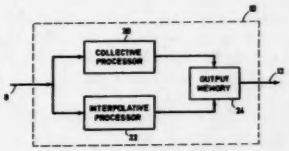
an output memory for storing representations of output pixels arranged in a second Cartesian matrix of k columns and n rows,

storage means for storing a plurality of look-up table sets, each look-up table set representative of a separate transformation of said input pixels into said output pixels,

processor means adapted to employ one of said look-up table sets for transforming said input pixel values into said output pixels, wherein said processor means includes,

a collective processor means for transforming the input pixel





values of a first set of input pixels into a corresponding first set of output pixels, said first set of input pixels characterized by the condition that the pixel values of more than one input pixel are transformed to affect one output pixel, and

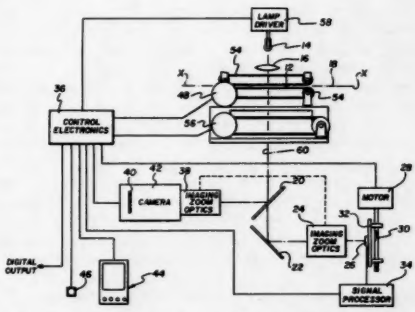
an interpolative processor means for transforming the input pixel values of a second set of input pixels into a corresponding second set of output pixels, said second set of input pixels characterized by the condition that the pixel value of one input pixel affects the value of more than one output pixel, and

means for selecting one of said plurality of look-up tables sets for use by said processor means.

5,067,020
DUAL SENSOR FILM SCANNER HAVING COUPLED OPTICS AND A VIDEO VIEWFINDER

David L. Funston, Batavia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 14, 1989, Ser. No. 450,762
Int. Cl.[5] H04N *5/253, 3/36*
U.S. Cl. 358—214 **9 Claims**



1. In an electronic scanning apparatus including means for projecting a selected image from a medium located in the film plane and bearing plural images, said apparatus including means for orienting the medium at each of a plurality of image-projecting positions, the improvement comprising:

means for illuminating and projecting a selected one of said plural images;

a two dimensional array of light sensitive elements have a first output;

a linear array of light sensitive elements having a second output;

means for directing at least a portion of the light of said selected image onto each array;

display means for displaying the output of the two dimensional array for initially viewing said image; and

selecting the sensitivity of the light sensitive elements in each of the arrays such that their sensitivity which corresponds to the amount of light falling thereon, is such that the output of a light sensitive element in one array can be used to predict the corresponding output of the light sensitive elements in the other array based on the selected sensitivities.

5,067,021

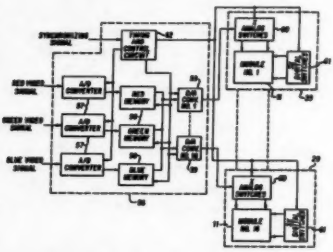
MODULAR FLAT-SCREEN TELEVISION DISPLAYS AND MODULES AND CIRCUIT DRIVES THEREFOR

Thomas P. Brody, 5823 Kentucky Ave., Pittsburgh, Pa. 15232

Filed Jul. 21, 1988, Ser. No. 222,523

Int. Cl.[5] H04N *9/30*; H05B *37/00*

U.S. Cl. 358—241 **16 Claims**



1. A flat-screen television display comprising:

A. a plurality of modules positioned adjacent each other to form an array the size of the desired flat-screen display;

B. each of said modules having a substrate with first and second major surfaces and edge surfaces, a matrix of picture elements extending over the first major surface of the substrate in a regular pattern with boundary picture elements adjacent the edge surfaces of the substrate to distances such that the regular pattern is continued substantially uninterrupted between adjacent said modules, a matrix of electrical switching elements extending over the first major surface of the substrate with each of said switching elements capable of activating one of said picture elements upon receiving electrical signals through both row and column conductive strips, said row and column conductive strips each extending over the first major surface from adjacent an edge surface to adjacent an opposite edge surface of the substrate such that each said switching element can be electrically activated by a row and a column conductive strip, an electrical drive circuit positioned adjacent the second major surface of the substrate and capable of electrically activating the switching elements in correspondence to desired video images to be formed by the picture elements over the first major surface, and interconnecting conductors electrically connecting the drive circuit with the row and column conductive strips on the first major surface and electrically insulated from similar interconnecting conductors of an adjacent module; and

C. an electrical control circuit capable of categorizing incoming video signals corresponding to the modules in the array and directing electrical signals corresponding to the categorized video signals to the drive circuit of each said module according to the portion of said desired video images to be reproduced by the picture elements on that module.

5,067,022

TELEVISION SET FASCIA

Dominique Huerre, Angers, and Jacques Mehu, Saint Barthelemy D'Anjou, both of France, assignors to Societe Electronique de la Region Pays de Loire, Courbevoie, France

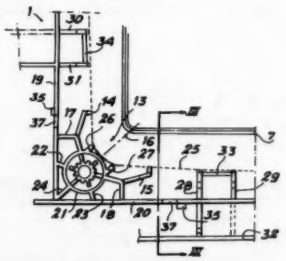
PCT No. PCTFR/89/00515, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/04902, PCT Pub. Date May 3, 1990

PCT Filed Oct. 6, 1989, Ser. No. 487,958

Claims priority, application France, Oct. 19, 1988, 88 13761

Int. Cl.[5] H04N *5/645*

U.S. Cl. 358—248 **5 Claims**



1. A television set fascia comprising:

an inner rim having a surface which faces and contacts a screen of a cathode-ray tube of said television set, said surface of said inner rim defining a step-portion of reduced thickness with respect to said inner rim for reducing debris caused by friction between said surface and said screen and catching the debris from said friction in said step portion; and

two elastic tabs for centering the cathode-ray tube located on each corner of an inner face of said fascia, said two elastic tabs being symmetrically arranged with respect to a bisector on each of said corners.

5,067,023

IMAGE DATA CODING APPARATUS

Eun J. Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

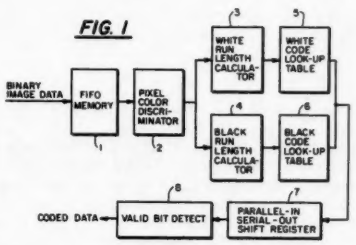
Filed Jun. 28, 1990, Ser. No. 544,946

Claims priority, application Rep. of Korea, Jun. 29, 1989, 89-9105

Int. Cl.[5] H04N *1/419*

U.S. Cl. 358—261.1 **4 Claims**

FIG. 1



1. An image data coding apparatus for coding binary image data, comprising:

a FIFO memory for sequentially reading binary image data, for outputting them in the inputted order;

a pixel color discriminating section for discriminating the colors of the pixels outputted from said FIFO memory;

black and white run length calculating sections for calculating the run lengths of the pixels of which color has been discriminated by said pixel color discriminating section;

black and white code look-up tables for receiving the address of the code position corresponding to the pixel run lengths outputted from said black and white run length calculating sections;

parallel input/serial output shift registers for shifting the parallel data outputted by said look-up tables into serial data form; and

a valid bit detecting section for extracting only valid bits among serial data outputted from said parallel input/serial output shift register, and for generating parallel data in byte units.

5,067,024

RECORDING APPARATUS WITH CONTROL OF STORED OVERLAPPING FORM DATA FOR TWO SIDED PRINTING

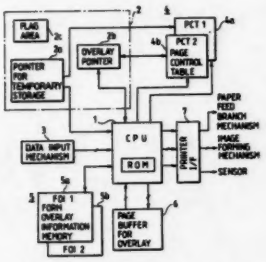
Katsuhiko Anzai, Ichihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 374,657, Jun. 30, 1989, abandoned. This application Mar. 15, 1991, Ser. No. 670,401

Claims priority, application Japan, Jul. 8, 1988, 63-168869

Int. Cl.[5] H04N *1/21, 1/23*

U.S. Cl. 358—296 **11 Claims**



1. A recording control apparatus comprising:

input means for entering data from external equipment;

first and second memory means for storing form data;

output means for outputting to a recording means the data entered via said input means and the form data in an overlaid manner as recording data for a first face or a second face of a recording material;

first designating means for indicating that the form data is new form data to be overlaid;

second designating means for indicating that the form data is previous form data; and

control means for controlling said first and second memory means in such a manner that when first form data is entered from the external equipment, said first form data is stored in said first memory means, and when second form data is entered from the external equipment, said second form data is stored in said second memory means,

wherein said first designating means is adapted, in storage of the first form data, to designate said first memory means, and while said first designating means is adapted, in storage of the second form data, to designate said second memory means, said second designating means is adapted to designate said first memory means.

5,067,025

METHOD OF RECORDING HALFTONE DOT IMAGE

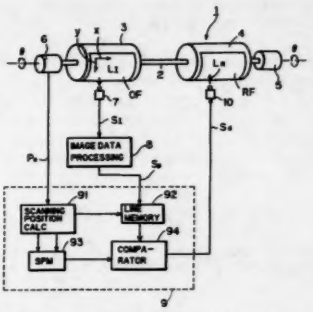
Osamu Kitagawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 14, 1990, Ser. No. 582,236

Claims priority, application Japan, Sep. 14, 1989, 1-239056

Int. Cl.[5] H04N *1/23*

U.S. Cl. 358—298 **15 Claims**



1. A method of recording a halftone dot color image on a recording medium, comprising the steps of:

(a) separating an original image into a plurality of color component images;

(b) converting said plurality of color component images into a plurality of color component halftone dot images under a procedure including the following conditions (b-1) through (b-5);

(b-1) said plurality of color component halftone dot images have respective arrays of unit regions defining cells in halftone dot representation;

(b-2) said respective arrays of unit regions have a substantially same array pitch and a substantially same orientation;

(b-3) a plurality of core positions are defined in each unit region in said respective arrays;

(b-4) a plurality of linear dot elements which have a substantially same area and which extend from said plurality of core positions along respective predetermined directions are obtained in said unit regions when a halftone dot area rate of corresponding color component halftone dot image is in a predetermined range of dot area rate; and

(b-5) said respective predetermined directions are different for each color component halftone dot image; and

(c) overprinting said plurality of color component halftone dot images on a recording medium to obtain a halftone dot color image on said recording medium.

5,067,026

APPARATUS FOR RECORDING AND REPRODUCING A VIDEO SIGNAL

Shinji Kaneko, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,827

Claims priority, application Japan, May 6, 1988, 63-110088; May 16, 1988, 63-118608

Int. Cl.[5] H04N *5/21, 9/80*

U.S. Cl. 358—340 **2 Claims**

1. An apparatus for recording and reproducing a video luminance signal comprising:

a record medium providing a transfer characteristic similar to that of a limiter in respect to a signal recorded on, and reproduced from said record medium;

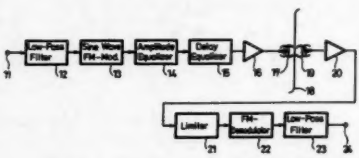
frequency-modulating means for frequency-modulating an input video luminance signal so that a sine wave modulated signal is generated thereby as an output signal having a base band and low-order and high-order upper and

lower side bands; p1 phase equalizer means connected to said frequency-modulating means for successively rotating a phase of said output signal of the frequency-modulating means, so that phases of said high-order upper and lower side bands are relatively shifted by about 180 degrees and brought into substantial equality with each other;

amplitude equalizer means for compensating for variations in the amplitude of the phase-rotated output signal caused by said phase equalizer means so that the level of the resulting amplified signal is suitable for the recording thereof;

means for recording said amplified signal from said amplifying means on the record medium;

pick-up means for reproducing said signal recorded on the record medium and providing therefrom a reproduced video luminance signal which includes noise and in which said high-order side bands are suppressed by said transfer characteristic similar to that of a limiter;



noise reducing means connected to said pick-up means for reducing said noise included in said reproduced video luminance signal, said noise reducing means including at least first and second serially connected signal processing circuits;

each of said signal processing circuits having a limiter which receives a respective input signal for equalizing amplitudes of upper and lower side band components of said respective input signal, a high-pass filter connected in series to said limiter of the respective signal processing circuit so as to receive an output signal of said limiter, a low-pass filter also connected to receive said input signal received by said limiter of said respective signal processing circuit and an adder for adding output signal of said high-pass filter and low-pass filter, respectively; and

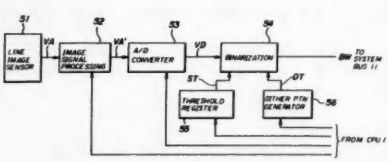
means for frequency demodulating an output signal or said second signal processing circuit.

5,067,027

IMAGE DATA TRANSMISSION METHOD AND APPARATUS

Satoshi Yano, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 392,044
Claims priority, application Japan, Aug. 18, 1988, 63-203787
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—439 **15 Claims**



1. An image data transmission method wherein a transmitter having a document reading system sends image data to a receiver having an image recording system, said method comprising the steps of:

calling said receiver from said transmitter;

letting the transmitter know an image recording characteristic of said image recording system provided in said receiver to said transmitter when said receiver is called, an image being recorded, by said image recording system, on a recording medium according to said image recording characteristic;

adjusting a document reading characteristic of said document reading system provided in the transmitter so as to match said image recording characteristic of the image recording system provided in said receiver, wherein when said image recording characteristic of the image recording system in the receiver is set to a low image density, said adjusting step adjusts said document reading characteristic to a high image density so as to match said image recording characteristic of the image recording system;

reading the document according to said document reading characteristic by said document reading system provided in said transmitter;

sending image data obtained by reading said document to said receiver; and

recording, by said image recording system provided in the receiver, an image formed by said image data supplied from said transmitter according to said image recording characteristic.

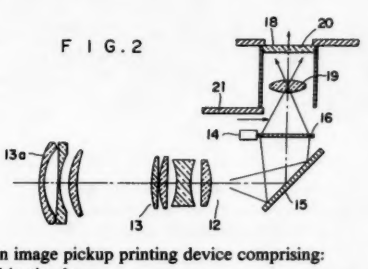
5,067,028

IMAGE PICKUP PRINTING DEVICE

Wataru Ogura, Suwa, and Hiroshi Kamijima, Okaya, both of Japan, assignors to Chinon Kabushiki Kaisha, Nagano, Japan

Continuation of Ser. No. 295,755, Jan. 11, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 587,633
Claims priority, application Japan, Jan. 25, 1988, 63-13796
Int. Cl.[5] H04N *1/04*
U.S. Cl. 358—494 **1 Claim**

F I G. 2



1. An image pickup printing device comprising:

an objective lens;

an optical view-finder for monitoring an image through said objective lens, said optical view-finder including a reflection mirror for reflecting said image, a focusing plate for focusing said reflected image, and enlarging means for enlarging said focused image;

a line image sensor arranged to slide with said focusing plate, for scanning said focused image;

a line printer for printing an image obtained by said line image sensor; and

shutter means, comprising a shutter which is slidably movable into a position between said view-finder and said focusing plate, for preventing light from reaching said line image sensor via said view-finder, said shutter means further comprising driving means for automatically positioning said shutter into said position between said view-finder and said focusing plate upon starting said printing;

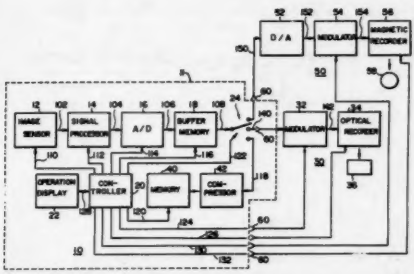
wherein said view-finder and said focusing plate are disposed along a common optical path.

5,067,029

ELECTRONIC STILL CAMERA CAPABLE OF SELECTING RECORDING MEDIA

Yohnosuke Takahashi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1989, Ser. No. 333,914
Claims priority, application Japan, Apr. 8, 1988, 63-85120
Int. Cl.[5] H04N 5/225
U.S. Cl. 358—909 8 Claims



7. An electronic still camera for shooting an object field to record a still picture representative of the object field in a recording medium, comprising:

imaging means for shooting the object field to produce a video signal representative of the object field;

analog-to-digital signal converter means for converting said video signal produced from said imaging means into a digital signal corresponding to said video signal;

storage means for temporarily storing said digital signal produced from said analog-to-digital signal converter means, said storage means being operative at a plurality of readout speeds;

digital-to-analog signal converter means for converting said digital signal produced from said storage means into an analog signal corresponding to said digital signal;

first recording means for recording said analog signal developed from said digital-to-analog signal converter means in an analog, magnetic recording medium at a first recording rate;

signal compressing means for compressing said digital signal read out from said storage means to produce a resultant signal;

third recording means for recording said resultant signal produced from said signal compressing means in a semiconductor storage medium at a third recording rate lower than said first recording rate;

second recording means for recording said digital signal read out from said storage means in an optical storage medium at a second recording rate lower than said first recording rate and said third recording rate, at least one of said magnetic recording medium and said semiconductor storage medium being detachably connectable to a corresponding one of said first and second recording means;

selector means for delivering said digital signal read out from said storage means selectively to either one of said digital-to-analog signal converter means, and said second recording means said signal compressing means; and

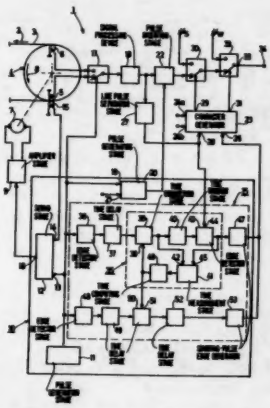
control means for controlling said imaging means, said analog-to-digital signal converter means, said storage means, said first and, second, and third recording means said selector means to read out said digital signal from said storage means to selectively supply said digital signal to either one of said first, second, and third recording means to any of said first, second, and third recording rates.

5,067,030

SYSTEM FOR REPRODUCING PICTURE SIGNALS AND INSERTING CHARACTER SIGNALS IN THE REPRODUCED PICTURE SIGNALS

Franz Kuchar, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1989, Ser. No. 377,362
Claims priority, application Austria, Jan. 27, 1989, 164/89
Int. Cl.[5] G11B 27/02; H04N 5/78
U.S. Cl. 360—14.1 3 Claims



1. A system for reproducing a plurality of picture signals recorded in juxtaposed inclined tracks on magnetic tape and comprising a character generator for inserting character signals into said reproduced picture signals each of which comprises a plurality of line pulses, said system further comprising:

a) at least one rotatable magnetic head for consecutively scanning said tracks;

b) a pulse generating device coupled to said magnetic head, for generating a position-pulse at the beginning of each scan of a track by said magnetic head;

c) a control device comprising a detector for detecting a line pulse n, where n is an integer, from each of said picture signals, and means for generating a starting-pulse edge at a variable time interval defined by the position-pulse and the occurrence of said nth line pulse.

5,067,031

METHOD AND APPARATUS FOR PROCESSING VIDEO SIGNALS RECORDED ON OR RECOVERED FROM MAGNETIC MEDIA

Tatsuo Yamasaki, and Toshifumi Fujii, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,883, Oct. 27, 1987, abandoned.
This application Mar. 6, 1990, Ser. No. 489,877
Claims priority, application Japan, Oct. 28, 1986, 61-257406; Nov. 19, 1986, 61-275689
Int. Cl.[5] G11B 5/02; H04N 5/78
U.S. Cl. 360—22 3 Claims

1. A recording apparatus for processing a video signal of one television field for recording on a magnetic recording medium comprising:

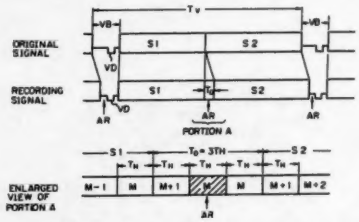
means for separating the video signal of one television field into a plurality of segments, each segment including a plurality of video lines;

means for detecting a joint portion between adjoining segments;

means for inserting an additional time period between adjoining segments of the video signal;

a first means for inserting further signals into the additional

time period, wherein said further signals include signals corresponding to signals of at least one video line included in at least one of the segments adjoining the detected joint portion wherein said signals of at least one video line are the signals of a first video line of the segment located immediately after the detected portion; and



a second means for inserting, into the additional time period, the signal of a last video line of the segment located immediately before the detected joint portion between the inserted signal of the first video line of the segment located immediately after the detected joint portion and the segment located immediately after the detected joint portion.

5,067,032

HEAD DRIVER

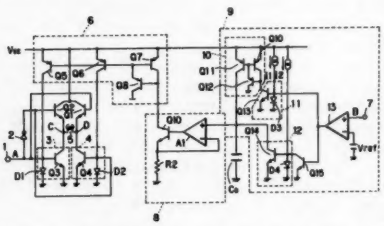
Shizuo Ida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1989, Ser. No. 352,877

Claims priority, application Japan, Dec. 9, 1988, 63-312675

Int. Cl.[5] G11B *5/09, 5/02*

U.S. Cl. 360—46 **15 Claims**



1. A head driver for driving a coil head for recording a signal responsive to a current flowing through the coil head in a magnetic recording medium, comprising:

first and second source terminals for supplying first and second potentials, respectively;

a capacitor having first and second ends, said first end being connected to said first source terminal;

a control terminal for receiving a control signal having first and second levels for switching charging and discharging of said capacitor;

a charging and discharging circuit provided between said first and second source terminals, having an input connected to said control terminal and an output connected to said second end of said capacitor, for charging said capacitor in response to said first level of said control signal and discharging said capacitor in response to said second level of said control signal;

a voltage-current conversion circuit connected to said second end of said capacitor for converting a charging voltage of said capacitor to output a first current responsive to a level of the charging voltage; and

a first current supply circuit connected with said coil head and said voltage-current conversion circuit for supplying said first current output from said voltage-current conversion circuit to said coil head.

5,067,033

ROTATION CONTROL DEVICE USING REPRODUCED SYNCHRONIZING SIGNAL

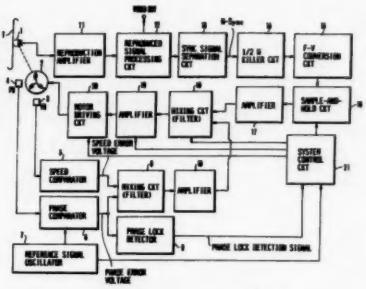
Tetsuya Wakui, Chiba, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1989, Ser. No. 369,011

Claims priority, application Japan, Jun. 21, 1988, 63-154515

Int. Cl.[5] G11B *21/04*

U.S. Cl. 360—70 **23 Claims**



1. A rotation control device comprising:

a) a rotary body for moving a recording medium and a head means relative to each other;

b) speed control means for detecting a speed deviation of said rotary body and for controlling a rotation speed of said rotary body according to the speed deviation detected;

c) phase control means for detecting a rotation phase deviation of said rotary body and for controlling a rotation phase of said rotary body according to the rotation phase deviation detected;

d) gate means for extracting a synchronizing signal in the video signal reproduced from the recording medium by said head means; and

e) synchronizing control means for synchronizing, when detecting that the rotation phase of said rotary body has been locked, said rotary body with the synchronizing signal extracted by said gate means.

5,067,034

TAPE RECORDER HAVING A BASE PLATE COMPRISED OF A SYNTHETIC MAIN PLATE HELD BETWEEN AND INTEGRAL WITH TWO AUXILIARY PLATES MADE OF A METAL MATERIAL

Kunio Kido, Wako, Japan, assignor to Tanashin Denki Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1989, Ser. No. 321,177

Claims priority, application Japan, Jun. 15, 1988, 63-79327[U]; Oct. 27, 1988, 63-140807[U]; Nov. 22, 1988, 63-152895[U]

Int. Cl.[5] G11B *15/48*

U.S. Cl. 360—74.1 **2 Claims**

1. An automatic reversing tape recorder apparatus having a magnetic head, comprising:

a base plate, said base plate including a main base plate formed of a synthetic resin material, said main base plate being held between and integral to first and second auxiliary base plates each made of a metal material;

a pair of reel receivers disposed on said base plate, each of said reel receivers having a reel gear provide at a lower end portion thereof;

a pair of capstans selectively connected to said reel gears via a pair of fixed speed rotation transmitting gears or a pair of high speed rotation transmitting gears which transmit rotation of said capstans to said respective reel gears;

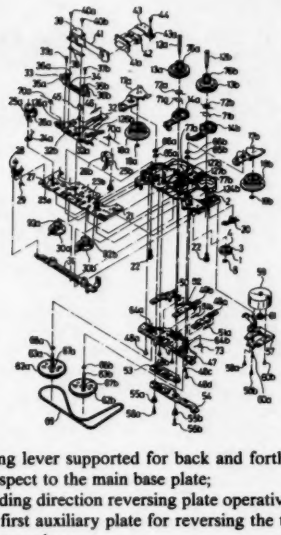
a pair of pinch roller supporting members each having a pinch roller supported for rotation thereon;

a pair of upright support shafts disposed on said first auxil-

iary base plate, each of said support shafts supporting a corresponding one of said pinch roller supporting members for pivotal motion thereon;

a plate-formed operating lever for operation of said tape recorder at a fixed speed operatively coupled to said magnetic head for moving said magnetic head to a tape reproducing position;

a pair of plate-formed operation levers for operation of said tape recorder at a high speed and a plate-formed stopping



operating lever supported for back and forth movement with respect to the main base plate;

a tape feeding direction reversing plate operatively coupled to said first auxiliary plate for reversing the tape feeding direction; and

at least one spacing formed in said main base plate for accommodating said reel gears, said fixed speed rotation transmitting gears and said high speed rotation transmitting gears.

5,067,035

ERROR PREVENTION IN A RECORDING AND REPRODUCING DEVICE WITH AT LEAST ONE ROTATING HEAD

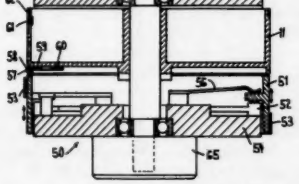
Stefan Kudelski, Le Mont; Jean-Claude Schlup, Cugy, and Ernest Rosselet, Assens, all of Switzerland, assignors to Kudelski SA fabrique de'enregistreurs Nagra, Chesequx, Switzerland

PCT No. PCT/CH87/00057, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO88/09550, PCT Pub. Date Dec. 1, 1988

PCT Filed May 22, 1987, Ser. No. 314,063

Int. Cl.[5] G11B *15/665, 15/61*

U.S. Cl. 360—85 **3 Claims**



1. A device for recording/reproducing signals comprising at least one rotatable head for recording/reproducing said signals by helical scanning, comprising:

a flexible support having a plurality of tracks on which said signals are recorded/reproduced by said rotatable head;

a scanner with a rotatable drum bearing said at least one head, said flexible support being wound and shifted helically around said rotatable drum, said scanner further comprising a stationary drum bearing a helical ramp for laterally guiding said flexible support during its helical shifting around said rotatable drum; and

said device further comprising means for producing a resilient deformation of said stationary drum to enable modification of the step and angle of the helix of the helical ramp to correct for errors in the scanning of said tracks due to a modification of the moving speed of said flexible support.

5,067,036

CASSETTE LOADING MECHANISM FOR ACCOMMODATING CASSETTES OF VARIOUS SIZES

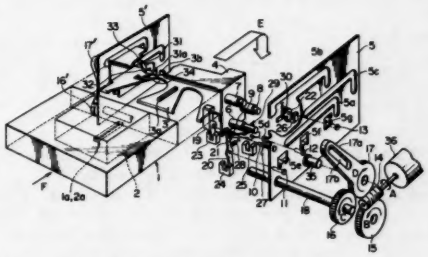
Tsugutaro Ozawa, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,705

Claims priority, application Japan, Feb. 28, 1989, 1-045297

Int. Cl.[5] G11B *15/675, 15/18*

U.S. Cl. 360—96.5 **11 Claims**



1. A cassette loading mechanism comprising:

a cassette holder for holding a cassette positioned at a first position;

a support member for supporting said cassette holder so that said cassette holder can be moved along a predetermined path from said first position to a second position at which the cassette is arranged in a loaded position;

a driving member for moving said cassette holder along said path;

first detection means for detecting a movement of said cassette holder from said first position to said second position;

second detection means for detecting a movement of said cassette holder from said second position to said first position, wherein said driving member is controlled in accordance with an output from each of said first detection means and said second detection means;

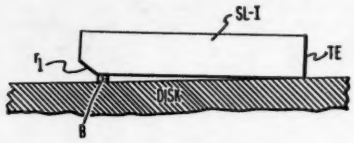
specific position detection means for detecting a reaching of said cassette holder at a specific position along said predetermined path, said specific position being a position different from either said first position or said second position so that said driving member is controlled by an output from said specific position detection means during movement of said cassette holder from said second position to said first position and said cassette holder is stopped at said specific position, whereby said cassette can be pulled out from said cassette holder.

5,067,037

SLIDER WITH BOSS

Raju S. Ananth, San Jose, and Michael A. Verdone, Hillsborough, both of Calif., assignors to Unisys Corp., Detroit, Mich.

Division of Ser. No. 422,186, Oct. 16, 1989, Pat. No. 5,034,828.
This application Mar. 5, 1991, Ser. No. 664,727
Int. Cl.[5] G11B *5/60*
U.S. Cl. 360—103 17 Claims



1. In a magnetic disk recording slider means for presenting transducer means, said slider means including disk-confronting slider face portions for defining a prescribed flight-plane in its moving transducing mode, the improvement therein of anti-stiction boss means disposed on each said disk-confronting portion face so as to project toward a subject disk, said boss means being adapted for spacing said face from a subject disk and comprising:

slug means disposed medically on forward portions, only, of at least some slider face portions, said slug means projecting sufficiently to cross this "flight plane" and barely extend therebeyond, and to thereby reduce "stiction", and pitch-up the slider means when the said slider is "landing", or is "taking-off" or is "at rest" on the associated disk.

5,067,038

ROTARY MAGNETIC HEAD DEVICE HAVING TWO DIFFERENT KINDS OF HEADS

Toshio Tsuchiya; Mitsuo Abe, both of Kanagawa; Nobuo Arai, Tokyo; Masumi Hisatomi, Kanagawa, and Hideo Zama, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1990, Ser. No. 548,628
Claims priority, application Japan, Jul. 5, 1989, 1-171784
Int. Cl.[5] G11B *5/52, 5/027, 15/60*
U.S. Cl. 360—107 7 Claims

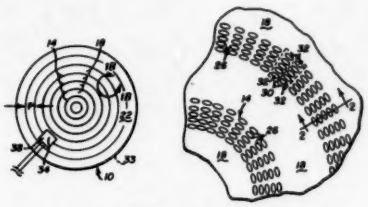
1. A helical scan type rotary magnetic head device comprising a rotary cylinder on which a magnetic tape is to be wound and magnetic head means mounted on and carried by said rotary cylinder, said magnetic head means being adapted to scan said magnetic tape in a slated direction with respect to a longitudinal direction of said tape, said magnetic head means including at least one thin film magnetic head composed of a non-magnetic substrate, a thin film magnetic core formed on said non-magnetic substrate and a thin film signal coil formed on said non-magnetic substrate, and at least one bulk type magnetic head composed of a bulk magnetic core and a signal coil wound on said bulk magnetic core.

5,067,039

HIGH TRACK DENSITY MAGNETIC MEDIA WITH PITTED OPTICAL SERVO TRACKS AND METHOD FOR STAMPING THE TRACKS ON THE MEDIA

Jimmy D. Godwin, and Stephen P. Williams, both of San Jose, Calif., assignors to Insite Peripherals, Inc., San Jose, Calif.

Filed Oct. 20, 1989, Ser. No. 424,658
Int. Cl.[5] G11B *5/596, 5/82*
U.S. Cl. 360—135 15 Claims



1. An information storage device having a magnetic layer suspended in a polymer binder coated on a substrate, comprising:

a magnetic medium having a flat substrate covered on a first side by a first magnetic coating;

a plurality of reduced reflectivity areas arranged to function as optical servo tracks on said first side of the magnetic medium, each of the areas having had its reflectivity to light reduced by means to disturb the surface contours of the first magnetic coating; and

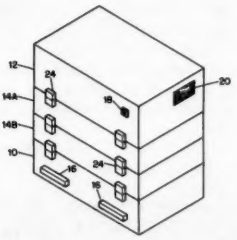
a plurality of areas for recording of magnetic data on said first side of the magnetic medium, substantially all of the individual areas for recording being positioned between each of the reduced reflectivity areas.

5,067,040

EXPANDABLE REFRIGERATED ENCLOSURE FOR COMPUTER BOARDS

Jocl Fallik, 56 Arthur Pl., Yonkers, N.Y. 10701

Filed Sep. 24, 1990, Ser. No. 587,014
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—384 12 Claims



1. An expandable refrigerated enclosure for electronic circuit boards, comprising:

a first section suitable for enclosing an electronic circuit board and including data input and output means and an air-flow opening in a principal horizontal surface;

a service section including an air-flow opening in a principal horizontal surface cooperating with said first section air-flow opening, partition means for containing a space within said service section adjoining said service section air-flow opening, and thermoelectric cooling means for transferring heat through a secured opening in said partition to provide cooled air in said space; and

first and second data and power coupling means, respectively supported by said first section and said service section for releasably mating when said first section and service section air-flow openings are in cooperating align-

ment and for enabling releasable mating to data and power coupling means of an insertable expansion section which includes bottom and top air-flow openings adapted to cooperate with said air-flow openings of said first and service sections;

whereby a two section enclosure is adapted for insertion of an expansion section having cooperating air-flow openings and data and power coupling means and cooled air is enabled to flow through said cooperating air-flow openings between said first and service sections to cool an internal space which is enclosed to inhibit entry of external air.

5,067,041

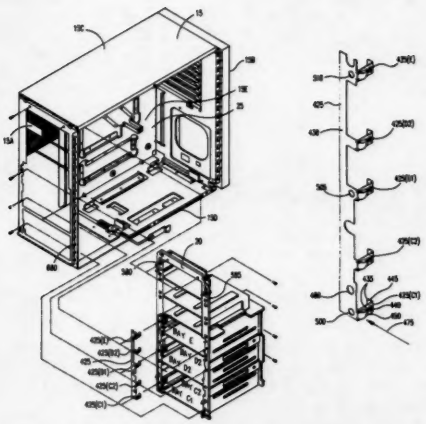
APPARATUS FOR REDUCING ELECTROMAGNETIC RADIATION FROM A COMPUTER DEVICE

Kevin K. Cooke, Delray Beach; John R. Dewitt, and John E. McCloskey, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,390

Int. Cl.[5] H05K *5/02, 9/00;* **H01R** *13/648*

U.S. Cl. 361—394 **22 Claims**



1. An enclosure for a computer, said enclosure comprising:

(a) an electrically conductive case and a non conductive I/O mounting structure situated within said case, said I/O mounting structure including means defining a plurality of bays for receiving I/O devices;

(b) a retainer removably connectable to said case to hold I/O devices within said bays;

(c) a grounding spring in electrical contact with at least one of said I/O devices; and

(d) a shielding strip, in electrical contact with said grounding spring, including a main body portion extending longitudinally along a first side of said case and in intimate conductive contact therewith, said main body portion located intermediate said first side of said case and said I/O mounting structure, and a plurality of spring structures extending laterally away from said main body portion and toward said bays, each of said spring structures including a first spring portion for contacting a conductive portion of an I/O device mounted in one of said bays and a second spring portion for contacting said retainer.

17. An electromagnetic interference (EMI)/radio interference (RFI) shielding spring structure, for use in an electrical device enclosure including an electrically conductive case, a nonconductive device support structure located within said case, at least one electrical device mounted within said support structure, a set of grounding springs, each of which is in electrical contact with said at least one electrical device, for electrically bridging said nonconductive device support structure for each device mounted therein, and a conductive device retainer, for retaining said at least one electrical device within said support structure, comprising:

(a) an electrically conductive spring strip; and

(b) a plurality of dual spring structures, each of which may be placed in electrical contact with one of said grounding springs, said case and said retainer, wherein said plurality of dual spring structures (1) are integrally formed with and extend from one side of said spring strip, (2) each comprise a first spring member that may be placed in electrical contact with a given one of said grounding springs to thereby ground the electrical device in contact with the given grounding spring to said case, and (3) each comprise a second spring member that may be placed in electrical contact with said device retainer to thereby ground said device retainer to said case, wherein said first spring member further comprises a contact plate which integrally extends from, and is oriented perpendicularly with respect to, said spring strip.

5,067,042

WIRING BOARD FOR FLAT PACKAGE TYPE INTEGRATED CIRCUIT DEVICE

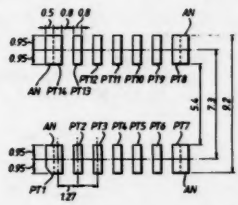
Katsumi Nagano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Continuation of Ser. No. 121,238, Nov. 16, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,233

Claims priority, application Japan, Dec. 6, 1986, 61-290797

Int. Cl.[5] H01R *9/00*

U.S. Cl. 361—406 **4 Claims**



1. A wiring board for solder mounting a flat package type integrated circuit device having a plurality of leads arranged in pairs in first and second parallel lines, the first line including a reference lead, an end lead, and remaining leads positioned between the reference and end leads, and the second line including two end leads and remaining leads positioned between the end leads, the wiring board comprising:

a board;

a plurality of first pattern pads, each having a first predetermined surface area, arranged on the board in positions corresponding to the remaining leads;

a reference pattern pad having a second predetermined surface area including a mounting portion arranged on the board in a position corresponding to the reference lead and a first width extension portion, the second predetermined surface area being larger than the first predetermined surface area and the first width extension portion

defining a unique pad shape such that the width of the reference pattern pad is greater than the width of the first pattern pads; and

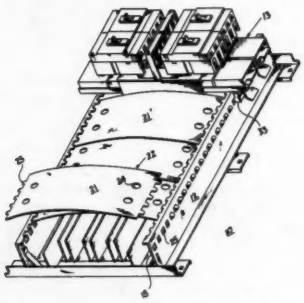
end pattern pads having a third predetermined surface area including a mounting portion arranged on the board in positions corresponding to the end leads and a second width extension portion, the third predetermined surface area being larger than the first predetermined surface area and the second width extension portion defining a pad shape such that the width of the end pattern pad is greater than the width of the first pattern pads.

5,067,043

ELECTRIC POWER DISTRIBUTION PANELBOARD-SWITCHBOARD BUS BAR INSULATION SHIELD

Robert G. Markowski, East Haven; Denis A. Perzan, Plainville; John A. Morby, Farmington, and Dean A. Robarge, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 13, 1990, Ser. No. 627,147
Int. Cl.[5] H02B *1/20*
U.S. Cl. 361—361 **10 Claims**



1. An interior for an electric switch or circuit breaker enclosure comprising:

support means supporting a plurality of electric switches or circuit breakers;

a plurality of electric bus bars extending along said support means and arranged for connecting with said electric switches or circuit breakers;

a pair of support rails arranged at opposing ends of said support means, said support rails including a plurality of slots through said support rails; and

an electrically insulating shield removeable attaching between said support rails and arranged over said bus bars thereby preventing access to said bus bars.

5,067,044

SENSOR FOR DETECTING A QUENCH IN A SUPERCONDUCTOR USING AN OPTICAL COUPLING

George T. Mallick, Jr., Monroeville; James R. Logan, Hampton Township, Allegheny County, and David Marschik, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1990, Ser. No. 489,137
Int. Cl.[5] H02H *9/00*
U.S. Cl. 361—19 **18 Claims**

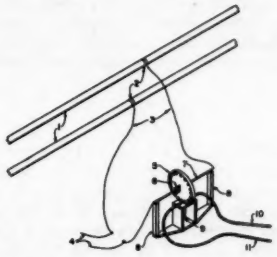
1. A sensor for detecting a quench in a superconducting coil comprising:

a readout coil located in a magnetic field produced by the superconducting coil that will move in response to a current flow between two potential leads connected to voltage taps on the superconducting coil caused by the presence of a quench in the superconducting coil;

at least one light source;

at least one light sensor aligned with the light source;

an optical encoder integrally attached to the readout coil and capable of interrupting light emitted by the light source and impinging on the light sensor;



a means of biasing the readout coil to return it to an original position when a quench is not present in the superconducting coil; and

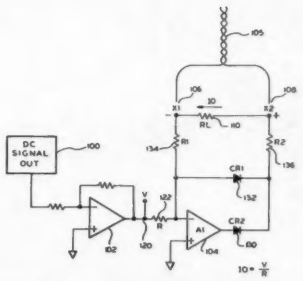
a means of remotely decoding the transmitted and interrupted light received by the light sensor to indicate the presence of a quench in the superconducting coil.

5,067,045

OUTPUT PROTECTION SCHEME FOR UNIPOLAR CONSTANT CURRENT SOURCE

Thaddeus J. Schweiger, St. Petersburg, Fla., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 69,334, Jul. 1, 1987, abandoned. This application May 30, 1989, Ser. No. 358,746
Int. Cl.[5] H02H *9/04*
U.S. Cl. 361—56 **13 Claims**



13. A cable driving and protective circuit transmitting an unipolar time varying signal to a cable and protecting the cable driving and protective circuit from extraneous surge voltages on the cable, comprising:

an operational amplifier having an input and an output, and having said unipolar signal connected to an input, said operational amplifier transmitting unipolar signal current to said cable;

a blocking diode connected to the output of said operational amplifier oriented to conduct said unipolar signal from the output of said operational amplifier, in a designed forward conduction mode with a low forward voltage drop, to said cable through a diode output terminal, and to block extraneous voltage of the same polarity but of greater magnitude than said unipolar signal by having a relatively high peak inverse voltage to prevent said blocking diode from conducting in an undesired reverse conduction mode; and

a shorting diode essentially shunting a voltage of a polarity

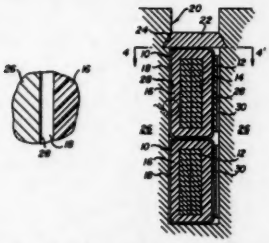
opposite the polarity of said unipolar signal in a forward conduction mode connected between the input of said operational amplifier and the output terminal of said diode said shorting diode being of the same diode type as that of said blocking diode.

5,067,046

ELECTRIC CHARGE BLEED-OFF STRUCTURE USING PYROLYZED GLASS FIBER

Richard K. Elton, Altamont, and William R. Schultz, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 643,908, Aug. 23, 1984, Pat. No. 4,853,565.
This application May 15, 1989, Ser. No. 351,235
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.[5] H05F *3/00*
U.S. Cl. 361—220 11 Claims



1. Structure for bleeding off static electrical charge or an electric charge developed on a finite segment of an insulator surrounding an electrical conductor due to the existence of an electric potential along said segment between said conductor and a region adjacent said finite segment of said insulator, said structure comprising:

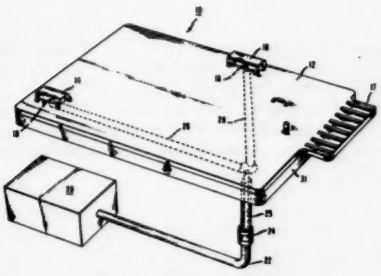
a layer of semi-conducting pyrolyzed glass fiber material having resistivity in the range of 200 to 10,000,000 ohms per square in intimate contact with said finite segment of said insulator and in electrical contact with an electrical ground.

5,067,047

CIRCUIT PACK WITH INBOARD JET COOLING

Kaveh Azar, Westwood, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 11, 1990, Ser. No. 522,290
Int. Cl.[5] H05K *7/20*
U.S. Cl. 361—384 12 Claims



1. A fluid-cooled circuit pack comprising:

a circuit board having front and back major surfaces with at least one heat generating component mounted on the front surface;

conduit means connectable to a source of compressed fluid and attached to the back surface of said circuit board to form a sealed plenum for conducting cooling fluid in a direction essentially parallel to said surfaces to a predetermined area at the back surface of said board; and

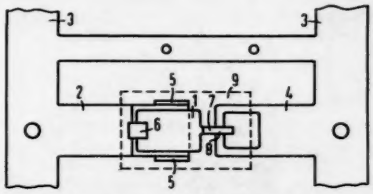
at least one hole in said circuit board connected to said conduit means, said hole extending from the back surface to the front surface in sufficient proximity to said component to form a cooling jet impinging on said component when said conduit means is connected to said source.

5,067,048

SOLID ELECTROLYTE CAPACITOR IN A CHIP STRUCTURE AND METHOD FOR THE MANUFACTURING THEREOF

Werner Schnabel, Nattheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1990, Ser. No. 574,797
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3931245
Int. Cl.[5] H01G *9/00, 5/01*
U.S. Cl. 361—540 6 Claims



1. A solid electrolyte capacitor, comprising:

a sintered anode member including a valve metal;

an oxide layer on said valve metal serving as a dielectric;

an anode wire sintered to and extending from said anode member;

a solid electrolyte on said oxide layer serving as a cathode;

an anode terminal electrically connected to said anode wire;

a cathode terminal electrically connected to said cathode, said cathode terminal comprising a first U-shaped clip partially embracing said anode member and a second auxiliary clip connected to said first U-shaped clip and oriented parallel and opposed to said first U-shaped clip and partially engaging said anode member; and

an envelope of plastic material covering said capacitor with said anode and cathode terminals extending therethrough.

5,067,049

PHOTOGRAPHIC STUDIO LIGHT REFLECTING APPARATUS

Daniel P. F. Milaire, 34288 Woodbine Crescent, Abbotsford, British Columbia, Canada V2S 2R5

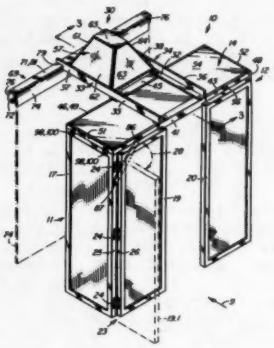
Filed Feb. 12, 1990, Ser. No. 478,952
Int. Cl.[5] G03B *15/02*
U.S. Cl. 362—18 18 Claims

1. A light reflecting apparatus for photography, the apparatus comprising:

(a) left hand and right hand laterally spaced apart vertical side wall pairs, each side wall pair having a stationary side wall panel and a movable side wall panel with inwardly facing diffuse light reflecting surfaces, the movable wall panel and stationary wall panel of each vertical side wall pair being hinged together about a vertical hinge to permit the movable panel to rotate relative to the stationary panel, the stationary panels of each pair having lower portions for setting on a supporting surface to support each pair of panels so that the panels thereof are essentially vertical,

(b) a horizontal top wall panel supported on and extending between the stationary side wall panels, the top wall panel

having a downwardly facing diffuse light reflecting surface and being releasably connected to the stationary side wall panels, the movable panels being clear of the top wall



panel to permit each movable panel to rotate about the respective vertical hinge relative to the adjacent stationary panel.

5,067,050

ILLUMINATED ELECTRICAL PART

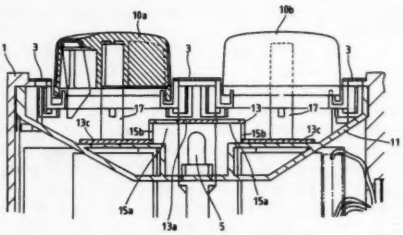
Minoru Oyama, and Misturu Furudate, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1991, Ser. No. 666,097

Claims priority, application Japan, May 1, 1990, 2-45100[U]

Int. Cl.[5] G01D *11/28*

U.S. Cl. 362—30 **2 Claims**



1. An illuminated electrical part comprising:

a case;

an indicator panel fixed to the front open end of the case;

a housing attached to the case so as to define an illuminating space behind the indicator panel; and

an illuminating device comprising:

a light source disposed behind the indicator panel and mounted on the housing; and

a cover formed of a highly heat-conductive material, fixed to the housing so as to cover the light source, and provided with light control slits in its top wall extending between the indicator panel and the light source and with control apertures in its side walls.

5,067,051

CHEMILUMINESCENT LIGHTING ELEMENT

Jacques Ladyjensky, Brussels, Belgium, assignor to American Cyanamid Company, Stamford, Conn.

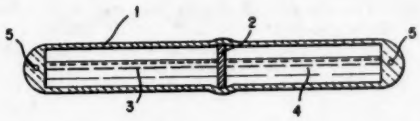
Filed Jun. 22, 1990, Ser. No. 542,138

Claims priority, application Belgium, Jul. 7, 1989, 08900744

Int. Cl.[5] F21K *2/00*

U.S. Cl. 362—34 **11 Claims**

1. A chemiluminescent element comprising a tube made of a flexible, light-emitting and chemically stable material, which is closed at both of its ends and which comprises at least two compartments which are filled with liquids which produce chemiluminescent light when mixed, characterized by the fact that it contains, between said ends, at least one internal diaphragm or disk which separates the tube into said compartments, said diaphragm or disk 1) having approximately a circular shape with a cross-section which is approximately rectangular in profile and a peripheral sharp edge, 2) being positioned transversely with respect to the axis of the tube, 3) having its periphery in continuous contact with the interior of the tube



wall, 4) being significantly more rigid than the material of which the tube is formed and 5) a thickness not greater than about one half the interior diameter of the tube, the elasticity, the external and internal diameters of the tube and the diameter of the diaphragm or disk being selected in such a manner that the diaphragm or disk can be tilted by simple pressure, manual measure or any equivalent means against the external walls of the tube, which pressure imparts a tilting torque on said diaphragm or disk and repositions said diaphragm or disk substantially parallel with respect to the axis of the tube thereby allowing the liquids in said compartments to mix.

5,067,052

VEHICULAR HEADLAMP HAVING INCLINATION DETECTOR

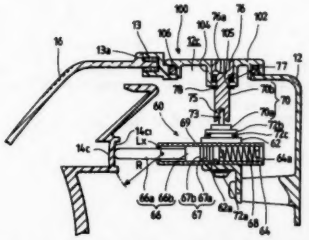
Takanori Suzuki, and Makoto Ito, both of Shizuoka, Japan, assignors to Koito Manufacturing Co. Ltd., Tokyo, Japan

Filed Apr. 23, 1991, Ser. No. 689,563

Claims priority, application Japan, May 24, 1990, 2-132547

Int. Cl.[5] R60Q *1/00*

U.S. Cl. 362—61 **17 Claims**



1. A vehicular headlamp in which an inclination member with a light reflecting surface for setting the axis of irradiation of a lamp is supported by an aiming mechanism in such a manner that said inclination member is inclinable with respect to a reference member arranged behind said inclination member, said vehicular headlamp having an inclination detector which comprises:

a stationary holder secured to said reference member;

a movable holder coupled to said stationary holder in such a manner that said movable holder is slidable forwardly and rearwardly relative to said stationary holder, a rack being formed on one side of said movable holder;

a slider engaged with said movable holder in such a manner that said slider is slidable forwardly and rearwardly relative to said movable holder, said slider being elastically urged so that a front end thereof is abutted against said inclination member, whereby said slider is allowed to slide

as said inclination member inclines about a vertical axis; and

a zero point adjustment shaft having a gear mounted thereon which is engaged with said rack formed on one side of said movable holder, said zero point adjustment shaft being supported by said stationary holder and extending in a direction perpendicular to a sliding direction of said movable holder.

5,067,053

AUTOMOTIVE HEADLAMP

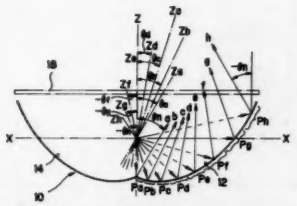
Kunio Akizuki, Shiraokamachi, Japan, assignor to Ichikoh Industries Ltd., Tokyo, Japan

Filed Nov. 30, 1989, Ser. No. 443,449

Claims priority, application Japan, Nov. 30, 1988, 63-300973

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **13 Claims**



1. An automotive headlamp, comprising a concave mirror having an inner reflecting surface, a lamp bulb as light source having its center thereof disposed nearly on an optical axis of said concave mirror and a substantially transparent cover disposed in front of said lamp bulb and covering the concave mirror, the inner reflecting surface of said concave mirror being composed of multiple different paraboloidal surfaces of revolution taking as common focus a predetermined point on said optical axis and smoothly joined to each other and said lamp bulb being so disposed as to have the center thereof disposed in the vicinity of the common focus, the center axis of each paraboloidal surface of revolution being a straight line passing through the common focus and offset a predetermined angle from said optical axis in a horizontal plane in which said optical axis lies, the inner reflecting surface consisting of a first reflecting zone, a second reflecting zone adjoining said first reflecting zone and a third reflecting zone adjoining said second reflecting zone, which are defined depending upon their distances from the common focus, said plural paraboloidal surfaces of revolution belonging to said first reflecting zone reflecting or diverging the light rays emitted from said lamp bulb and incident upon positions nearer to the common focus in directions away from said optical axis, the plural paraboloidal surfaces of revolution included in said second reflecting zone reflecting the rays incident from said lamp bulb in directions nearly parallel to said optical axis, and the plural paraboloidal surfaces of revolution belonging to said third reflecting zone reflecting or converging the rays emitted from said lamp bulb and incident upon positions away from the common focus in directions nearer to said optical axis.

5,067,054

BEAM-FORMING SHADE FOR VEHICULAR HEADLAMP

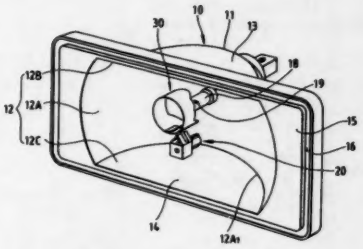
Hirohiko Oshio; Noboru Koike, and Takasi Ochiai, all of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,572

Claims priority, application Japan, Oct. 11, 1989, 1-118283[U]; Aug. 31, 1990, 2-228218

Int. Cl.[5] B60Q *1/00*

U.S. Cl. 362—61 **13 Claims**



1. A beam-forming shade for a vehicular headlamp, comprising:

a cylindrical shade body disposed horizontally in surrounding relation to a bulb of the vehicular headlamp; and

means for connecting said shade body to the headlamp, said connecting means having a single hole for inserting a screw,

wherein said cylindrical shade body and said connecting means are integrally formed from a single thin metal plate of a predetermined shape, said connecting means being formed by at least partially overlapped end portions of said single thin metal plate, said overlapped end portions each having a hole therein, said holes being aligned with one another to define said single hole for inserting a screw.

5,067,055

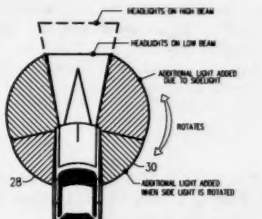
AUTOMOBILE HEADLAMP AND ROTATABLE SIDELAMP OF INTEGRATED CONSTRUCTION AND SWITCHING CIRCUIT FOR OPERATING SAME

Elmer D. Farnsworth, 9860 Brownlee Rd., Sweet, Id. 83670

Filed Jun. 15, 1990, Ser. No. 538,824

Int. Cl.[5] B60Q *1/06*

U.S. Cl. 362—66 **4 Claims**



1. In combination, a headlamp and sidelamp apparatus for an automobile wherein said sidelamp is rotatably mounted adjacent to said headlamp and having an initial and rotatable field of view which joins each side of the field of view of said headlamp and is operative upon receipt of lamp control motion signals to be rotated to a second field of view which is approximately ninety degrees displaced with respect to said initial field of view of said sidelamp to thereby rapidly aid and assist passengers in departing from the automobile at night in an unfa-

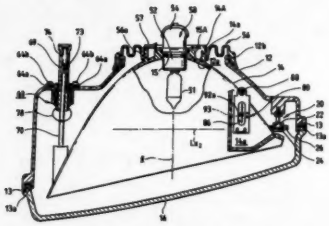
miliar location, lamp control means connected to said sidelamp for rotating and sweeping the field of illumination of said sidelamp to a chosen side angle field of view extending to 180 degrees with respect to the forward direction of travel of said automobile, thereby providing automatic blind spot illumination for a driver travelling in a dark area.

5,067,056

VEHICULAR HEADLAMP

Takanori Suzuki, and Yoshio Suzuki, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed May 2, 1991, Ser. No. 694,716
Claims priority, application Japan, May 23, 1990, 2-131354
Int. Cl.[5] B60Q *1/06*
U.S. Cl. 362—66 **10 Claims**



1. A vehicular headlamp in which an inclination member with a light reflecting surface which defines an axis of irradiation of said lamp is supported on one pivot point fixed in position with respect to a reference member and two aiming points which are engaged with two aiming screws supported by said reference member in such a manner that the distances of said two aiming points from said reference member are adjusted by turning said aiming screws, said one pivot point and two aiming points being positioned at respective vertices of a triangle, one side of which is horizontal as viewed from front, and said inclination member being swung about an inclination axis passing through said pivot point by turning said two aiming screws to adjust a direction of irradiation of said lamp, the improvement wherein said pivot point is positioned at one of the vertices of said triangle other than the vertex of the angle subtending the oblique side of said triangle, one of said aiming points which is moved away from said pivot point in a vertical direction being employed as a vertical aiming point, while the other of said aiming points, which is moved away from said pivot point in a horizontal plane, is employed as a horizontal aiming point, and an inclination detector for detecting an amount of inclination of said inclination member in a horizontal plane is provided between said reference member and said inclination member, said inclination detector being mounted in a horizontal plane including said pivot point as viewed from the front of said headlamp.

5,067,057

MULTIPLE PARABOLA LICENSE PLATE LAMP

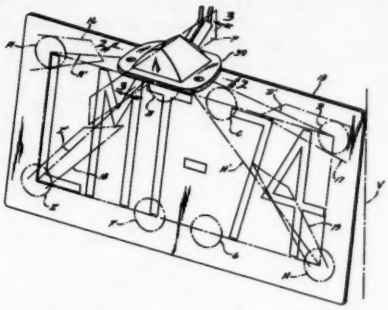
William C. Stapel, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 28, 1991, Ser. No. 661,967
Int. Cl.[5] B60Q *1/56*
U.S. Cl. 362—83.2 **12 Claims**

1. A lamp assembly for use in conjunction with a rectangular panel for illuminating a defined front surface of said panel from a location that is slightly forward and to one side of said panel, comprising:

a reflector housing having an opening oriented towards said panel and containing a plurality of parabolically curved first surface reflectors with a common focal point and separately oriented imaging fields;

an incandescent light source located within said housing at the common focus of said plurality of reflectors; and



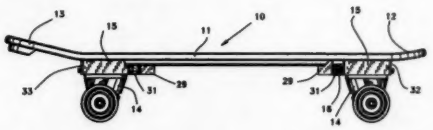
a lens element attached to said housing and covering said opening.

5,067,058

SKATEBOARD HAVING LIGHTING SYSTEM

Michael P. Standley, 5785 W. Rochelle Ave., Apt. 206, Las Vegas, Nev. 89103

Continuation-in-part of Ser. No. 335,991, Jul. 31, 1989, abandoned. This application Mar. 28, 1990, Ser. No. 501,280
Int. Cl.[5] B60Q *1/26;* **B62M** *1/00;* **G02B** *5/12*
U.S. Cl. 362—83.3 **10 Claims**



1. An improved skateboard having adjacent one of its ends a roller truck attached to the underside of a skateboard deck, the truck being insulated from the skateboard deck by a riser pad, wherein the improvement comprises:

a self-contained battery operated lamp housed in the riser pad,

the lamp having a cylindrical body forming a battery compartment that is expanded at one end to form a bulb containing compartment,

the riser pad having a stepped bore that is complementary to the shape of the lamp and contains the lamp therein,

the lamp being positioned to direct a light beam emanated therefrom from beneath the deck beyond the one end thereof, and

switch means for turning the lamp on and off.

5,067,059

AQUARIUM ORNAMENT LAMP SOURCE

Steven Hwang, 4F., No. 6-6, Alley 1, Lane 147, Sec. 3, Hsin Yi Road, Taipei, Taiwan

Filed May 8, 1991, Ser. No. 696,867
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 **2 Claims**

1. An aquarium ornament lamp source, comprising:

an optical fiber unit comprised of a plurality of optical fibers, having one end tied up together forming into a light ray

input terminal and an opposite end loosely arranged into a plurality of light ray output terminals;

a lamp source unit comprising a base plate having a rotary wheel pivoted thereto at the top and driven by a motor to rotate, said rotary wheel having a color filter around the periphery thereof, and a light source set in said rotary wheel to emit light through said color filter; characterized in that:

said bundle of optical fibers is fastened in an aquarium with said light ray output terminals loosely attached over the artificial landscape arranged in said aquarium; said lamp source unit is attached to the outside of said aquarium with said color filter aligned with said light ray input terminal; and wherein:

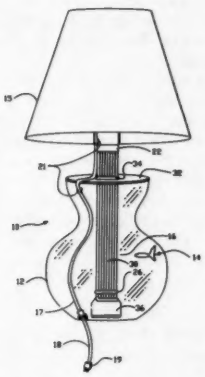
connection of power supply to said lamp source unit causes said motor to drive said rotary wheel to rotate and simultaneously causes said light source to emit light through said color filter toward said light ray input terminal so as to produce a variable lighting effect through said light ray output terminals.

5,067,060

AQUARIUM LAMP

Leo C. Sieracki, 1878 Market St., No. 202, San Francisco, Calif. 94102

Filed Apr. 5, 1989, Ser. No. 334,098
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 **13 Claims**



1. A lamp comprising:

an aquarium;

light source means mounted to and located above the aquarium;

aquatic life support means including an air pump for mechanically forcing the necessary gases sufficient to support aquatic life into said aquarium; and

load support means extending from a top of said aquarium down into said aquarium and including a conduit communicating said gases into said aquarium, said load support means supporting said light source means and a portion of said aquatic life support means above said aquarium.

5,067,061

DECORATIVE EXTERIOR TRIM LIGHTING SYSTEM

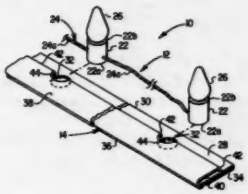
Robert B. Prickett, 3816 Mockingbird La., Dallas, Tex. 75205

Continuation-in-part of Ser. No. 464,200, Jan. 12, 1990, Pat. No. 4,974,128. This application Aug. 29, 1990, Ser. No. 575,154
Int. Cl.[5] F21S *1/02*
U.S. Cl. 362—145 **7 Claims**

1. Apparatus for supporting a light string along a surface to be decoratively illuminated, said light string including a mutually spaced series of bulb sockets having first end portions operatively receiving the base portions of a series of light bulbs, and second end portions operatively connected to longitudinal segments of a length of electrical power supply wiring, said apparatus comprising:

a first elongated strip portion having opposite side edge portions extending along its length, said first elongated strip portion being laterally securable to said surface to extend longitudinally therealong;

a longitudinally spaced series of openings formed through said first elongated strip portion and positioned between



its opposite side edge portions, said openings being sized to releasably receive said second end portions of said sockets; and

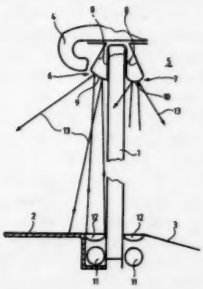
holding means, carried by said first elongated strip portion, for overlying and releasably holding in cavities along a surface of said first elongated strip portion, said longitudinal segments of said length of electrical power supply wiring when said second end portions of said bulb sockets are releasably received in said openings in said first elongated strip portion.

5,067,062

ILLUMINATION DEVICE FOR A TRANSPORT SYSTEM, ESPECIALLY ESCALATORS OR PASSENGER WALKWAY

Gerhart Rülke, Vienna, Austria, assignor to Inventio AG, Hergiswil NW, Switzerland

Filed Jul. 9, 1990, Ser. No. 550,185
Claims priority, application Switzerland, Jul. 14, 1989, 02652/89-0
Int. Cl.[5] F21S *3/14*
U.S. Cl. 362—146 **19 Claims**



1. An illumination device for the illumination of a transport system, such as escalators or passenger walkways, comprising:

at least one active light source configured for arrangement at at least a first predeterminate portion of said transport system for emitting light;

lens means cooperating with said at least one active light source for guidance of the emitted light;

means for reflecting light emitted by said at least one active light source configured for arrangement at at least a second predeterminate portion of said transport system; and

said transport system comprises a balustrade skirting, a balustrade cooperating with said balustrade skirting and a

handrail support device carried by said balustrade, said handrail support device having an underside, wherein:

said at least one active light source for emitting light and said lens means are configured for being arranged in said balustrade skirting; and

said means for reflecting light is configured for being arranged at the underside of said handrail support device.

5,067,063

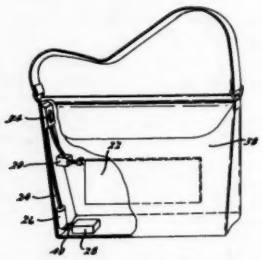
HANDBAG LIT WITH ELECTROLUMINESCENCE

Marilyn J. Granneman, and Gary N. Granneman, both of 7206 Crest La., Indianapolis, Ind. 46256

Filed Nov. 6, 1990, Ser. No. 609,809

Int. Cl.[5] A45C *15/6*

U.S. Cl. 362—156 **10 Claims**



1. In a carrying case having at least a pair of sidewalls defining an interior compartment and closure means for selectively opening and closing the case in order to respectively gain and block access to the interior compartment, an illumination system comprising:

a power source circuit permanently installed in the interior compartment, said power source circuit including a battery holder adapted to receive a replaceable direct current battery electrically connected to said power source circuit, inverter means electrically connected to said battery holder for converting direct current from said battery to alternating current, a first releasable electrical connector means, and switch means selectively actuable between on and off positions for respectively electrically connecting and disconnecting said battery holder and said inverter means to said first releasable electrical connector means;

a thin, flexible electroluminescent lamp having a second releasable electrical connector means for selective electrical connection with, and disconnection from, said first releasable electrical connector, said lamp and said second releasable electrical connector means being selectively insertable into, and removable from, the interior compartment; and

a thin transparent sheath-like pocket having an opening therein and being disposed on a first of the sidewalls of the carrying case, said lamp being selectively insertable through said opening into said pocket for illuminating the interior compartment when said first and second electrical connector means are electrically connected with one another and said switch means is actuated to said on position, and said lamp and said second electrical connector means being selectively removable from said pocket and said interior compartment for interchangeable installation and use in a second of said carrying cases having a second of said power source circuits permanently installed therein.

5,067,064

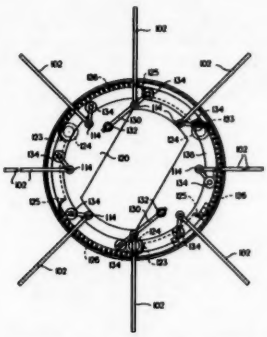
PATTERN CHANGE MECHANISM

Joel C. Gehly, McKean; David Zolner, Fairview, and James M. Szumigala, Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Mar. 16, 1990, Ser. No. 495,253

Int. Cl.[5] F21V *13/02*

U.S. Cl. 362—277 **19 Claims**



1. Apparatus for changing the size distribution of light emitted from a lighting fixture having a light source and a reflector superposing the light source in a partially circumscribing radially spaced relationship relative to the axis of symmetry of the lighting fixture for intersecting light radiating from the light source and directing the light toward a target surface, said apparatus comprising:

means for blocking light directed toward a target surface;

means for moving said blocking means into at least a first position and a second position, wherein, in said first position, no light is blocked to produce a first pattern of light distribution having a peak illuminance, and wherein, in said second position, a first portion of light directed toward the target surface is blocked to produce a second pattern of light distribution smaller than said first pattern such that said peak illuminance remains relatively constant.

5,067,065

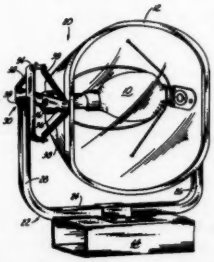
SHOCK ABSORBENT BULBHOLDER MOUNTING

Douglas L. Dahlgren, Holdrege, Nebr., assignor to Allmand Bros. Inc., Holdrege, Nebr.

Filed Oct. 31, 1990, Ser. No. 607,420

Int. Cl.[5] F21V *15/04*

U.S. Cl. 362—369 **3 Claims**



1. A bulbholder mounting assembly comprising:

a support member having a center section and a pair of spaced, transverse arm sections extending from said center section; and

means resiliently supporting said bulbholder from said support member between said arm sections comprising:

an elongated arm strap attached to a respective arm section;

an elongated bulbholder strap attached to said bulbholder, said arm strap and said bulbholder strap being disposed in spaced parallel planes, said arm strap and said bulbholder strap having longitudinal axes disposed at right angles to one another; and

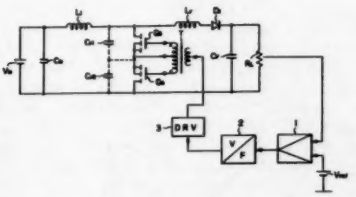
springs connected to said arm strap and said bulbholder strap such that each end of each strap is connected by two springs to opposite ends of the other strap, each spring being oriented at a 45° angle with respect to the longitudinal axes of the straps.

5,067,066

VOLTAGE-MODE QUASI-RESONANT DC/DC CONVERTER

Jun Chida, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 6, 1991, Ser. No. 651,518
Claims priority, application Japan, Feb. 6, 1990, 2-025062
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—16 **13 Claims**



10. An apparatus for use in a voltage-mode quasi-resonant converter, comprising:

an inductor;

a first MOSFET switch connected in series with said inductor;

a second MOSFET switch connected in series with said first MOSFET switch so that first and second anodes of respective first and second parasitic diodes of respective first and second MOSFET switches are connected,

said inductor, said first MOSFET switch and said second MOSFET switch being for use in the voltage-mode quasi-resonant converter.

5,067,067

METHOD FOR EVALUATING AND DESIGNING LENSES

Lee R. Estelle, Rochester, and Svetlana Z. Short, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1989, Ser. No. 376,269
Int. Cl.[5] G05B *13/00*
U.S. Cl. 364—156 **16 Claims**

1. In a method of making a lens, including the steps of creating an initial lens design, and optimizing the design using a merit function, the improvement comprising the steps of:

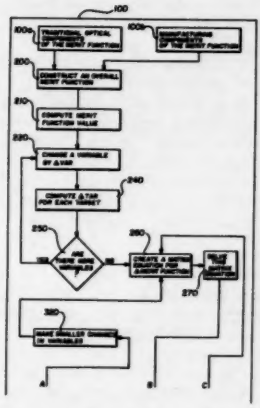
(a) defining a plurality of merit function components, each of which reflects a particular optical or manufacturing parameter, wherein one of said components reflects the manufacturability of aspheric surfaces, said manufacturability of said aspheric surfaces being evaluated based on the amount of aspheric bending in such aspheric surfaces;

(b) computing a numerical value for each of said merit function components based on corresponding features of a preliminary design of said lens;

(c) selecting weighting factors for various ones of said merit function components;

(d) computing from said merit function components and said weighting factors an overall merit function value expressable in numerical terms that reflect both optical and manufacturing criteria;

(e) successively varying at least one design feature of said lens and recomputing the resulting overall merit function value with each successive variation until the resulting



overall merit function reaches a predetermined acceptable value;

(f) obtaining the parameters of the optimized lens having said predetermined acceptable value for the resulting overall merit function; and

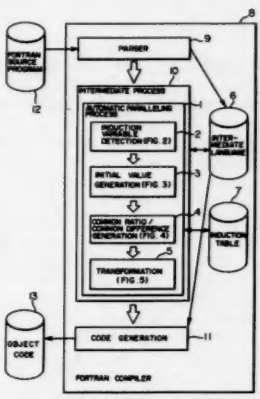
(g) implementing said parameters to make a lens.

5,067,068

METHOD FOR CONVERTING AN ITERATIVE LOOP OF A SOURCE PROGRAM INTO PARELLELLY EXECUTABLE OBJECT PROGRAM PORTIONS

Kyoko Iwasawa, Tokyo; Yoshikazu Tanaka, Omiya, and Shizuo Gotou, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,772
Claims priority, application Japan, Jun. 5, 1987, 62-139729
Int. Cl.[5] G06F *9/38, 9/45*
U.S. Cl. 395—650 **4 Claims**



1. A method for operating a data processor to compile a loop portion of a source program into a plurality of simultaneously executable object program portions for respective execution by a plurality of parallel processors, each said processor being

assigned loop iterations of said loop portion, comprising the steps of:

detecting whether said loop portion, stored in a first storage area of the data processor, includes a variable recursively defined during loop iteration;

producing, into a second storage area of the data processor, a computation program portion, when said recursively defined variable is detected, for calculating a value of the recursively defined variable for an arbitrary loop iteration number; and,

generating, into a third storage area of the data processor, a plurality of simultaneously executable object program portions, each said object program portion comprising one of a plurality of respective loop iterations of the loop portion, wherein each of said plurality of simultaneously executable object program portions includes a portion for executing the produced computation program portion for a respective loop iteration number to calculate a value of the recursively defined variable.

5,067,069

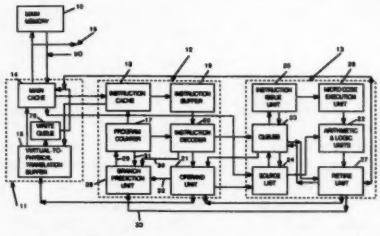
CONTROL OF MULTIPLE FUNCTIONAL UNITS WITH PARALLEL OPERATION IN A MICROCODED EXECUTION UNIT

Elaine H. Fite; Tryggve Fossum, both of Northboro; William R. Grundmann, Hudson; Francis X. McKeen, Westboro, and Ronald M. Salett, Framingham, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 3, 1989, Ser. No. 306,832

Int. Cl.[5] G06F *9/22, 9/28, 9/30, 9/38*

U.S. Cl. 395—375 **20 Claims**



1. A method of preprocessing and executing multiple instructions in a pipelined processor, said instructions including opcodes and operand specifiers, said pipelined processor including multiple and separate functional units for executing various classes of said instructions, said method comprising the steps of:

decoding said instructions to obtain said opcodes and operand specifiers;

fetching source operands specified by said operand specifiers;

operating a microcode-controlled issue unit to issue the source operands to the respective functional units indicated by the decoded opcodes, and for each of the instructions, to insert an entry into a result queue when an instruction is issued to a functional unit and the destination for the result is known, the entry indicating the particular functional unit and the destination for the result of the functional unit, wherein instructions are issued before their destinations are known;

operating the functional units in parallel to execute the various classes of said instructions including integer instructions, floating point instructions, multiply instructions, and divide instructions; and

successively retiring results by retiring the result from the functional unit indicated by the entry at the head of the result queue when the result is available and when the destination indicated by the entry is available, and removing the entry from the head of the queue.

5,067,070

WORD PROCESSOR WITH OPERATOR INPUTTED CHARACTER STRING SUBSTITUTION

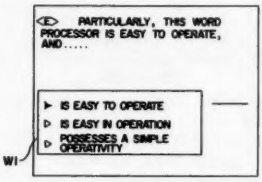
Kouji Miyao, Kashihara, and Hajime Asano, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 222,770, Jul. 22, 1988, abandoned. This application Sep. 4, 1990, Ser. No. 577,816

Claims priority, application Japan, Jul. 22, 1987, 62-184128; Jul. 30, 1987, 62-192976; Aug. 1, 1987, 62-193002

Int. Cl.[5] G06F *7/00, 15/20*

U.S. Cl. 395—146 **19 Claims**


PARTICULARLY, THIS WORD PROCESSOR IS EASY TO OPERATE, AND.....
IS EASY TO OPERATE
IS EASY IN OPERATION
POSSESSES A SIMPLE OPERATIVITY
WI

1. A word processor for editing selected portions of a text comprising:

means for supplying text to be edited and for storing the text in a first memory;

designating means, responsive to said means for supplying, for designating a portion of said text as a designated character string, the designating portion being designated by an operator of the word processor after the operator has reviewed the text to be edited;

input means for introducing into the word processor at least one substitute character string composed by the operator after the operator has reviewed the text to be edited;

a second memory for storing said at least one substitute character string;

substitute means, responsive to said designating means and input means, for substituting by selection performed by the operator said at least one substitute character string, for said designated character string in said text; and

alternative substitute string development means responsive to said substitute means for storing in said second memory said designated character string as another substitute character string for later use by said substitute means after said designated character string has been replaced in the text by said at least substitute character string.

5,067,071

MULTIPROCESSOR COMPUTER SYSTEM EMPLOYING A PLURALITY OF TIGHTLY COUPLED PROCESSORS WITH INTERRUPT VECTOR BUS

David J. Schanin, Sudbury; Russel L. Moore, Hudson; John R. Bartlett, Acton; Charles S. Namias, Burlington; David W. Zopf, Marlboro, all of Mass.; Brian D. Gill, Londondery, N.H.; Trevor A. Creary; Stephen S. Corbin, both of Natick, Mass.; Mark J. Matale, Sterling, Mass.; David F. Ford, Boston, Mass., and Steven J. Frank, Westboro, Mass., assignors to Encore Computer Corporation, Fort Lauderdale, Fla.

Filed Feb. 27, 1985, Ser. No. 706,142

Int. Cl.[5] G06F *9/46*

U.S. Cl. 395—275 **3 Claims**

1. A multiprocessor computer system comprising:

a plurality of processor modules, each module having at least one processor and having coupling interface means through which data, addresses and interrupts are communicated to and from each processor module, said processor modules also including a cache memory means for storing contents of frequently accessed memory locations;

system memory means having coupling interfaces through which data and addresses are communicated to and from said system memory means, said system memory means is accessible to each of said processors;

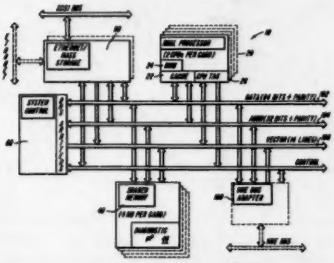
operation control means for allocating and controlling the operation of a plurality of processes on said plurality of processors, said operation control means including timing means for generating timing signals that define successive transaction intervals;

system bus means connected to said coupling interfaces of said plurality of processor modules and to said coupling interfaces of said system memory means including:

a) address bus means for transferring memory addressed from one of said plurality of processor modules to said system memory means;

b) data bus means for transferring data from said system memory means to said plurality of processor modules and from said plurality of processor modules to said system memory means;

c) vector bus means for transferring vectored interrupt signals between one of said plurality of processor modules and another of said plurality of processor modules, said vector bus means being independent from said



address and said data bus means; said vector bus means further comprising means for segregating system components including processor modules, I/O modules and operation control means into a plurality of groups that may receive vectored interrupt signals and for providing an even distribution of vectored interrupt signals within said groups so that all groups of the same type of components receive a substantially even number of vectored interrupt signals;

d) control line means for providing a path for signals to be transferred from said operation control means to said processor modules and said system memory means and from said processor modules and system memory means to said operation control means;

means for arbitrating access to each of said address, data and vector bus means;

whereby said operation control means allows said system to operate at high speeds by efficiently distributing processes to said processor modules which are tightly coupled.

5,067,072

VIRTUAL SOFTWARE MACHINE WHICH PREPROCESSES APPLICATION PROGRAM TO ISOLATE EXECUTION DEPENDENCIES AND USES TARGET COMPUTER PROCESSES TO IMPLEMENT THE EXECUTION DEPENDENCIES

Kirit K. Talati, Sunnyvale, and C. Willard Lackie, Garland, both of Tex., assignors to VISystems, Inc., Dallas, Tex.

Continuation of Ser. No. 391,691, Aug. 10, 1989, Pat. No. 4,961,133, which is a continuation of Ser. No. 118,307, Nov. 6, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 591,463

The portion of the term of this patent subsequent to Oct. 2, 2007, has been disclaimed.

Int. Cl.[5] G06F *9/455*

U.S. Cl. 395—650 **7 Claims**

1. A virtual software machine for providing a virtual execution environment in a target computer system for an application software program having one or more execution dependencies that are incompatible with a software execution environment on the target computer system, comprising:

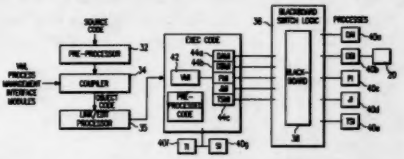
a plurality of independent processes;

a virtual control mechanism having a virtual management interface (VMI) for generating requests for execution to the plurality of independent processes and receiving results of such processing, wherein the requests for execution and the results are communicated via a message exchange mechanism;

pre-processing means for identifying at least one execution dependency of the application software program and in response thereto generating a pre-processed application software program that isolates the identified execution dependency from the application software program;

means connected to the pre-processing means for converting the pre-processed application software program and the virtual control mechanism into executable code for the target computer; and

run-time means run by the operating system of the target



computer system for executing the application software program in the target computer system despite the execution dependency that is incompatible with the target computer system software execution environment, wherein the run-time means comprises:

means for generating a request for execution when the execution dependency is encountered as the executable code is running in the target computer system;

means connected to the generating means for evaluating the request for execution to identify which of the plurality of independent processes is required to execute the request for execution;

means connected to the evaluating means for delivering the request for execution via a message to the identified independent process;

means connected to the delivering means for processing the request for execution using the identified independent process to thereby execute the request; and

means for returning results of the executed request back to the virtual management interface via a message.

5,067,073

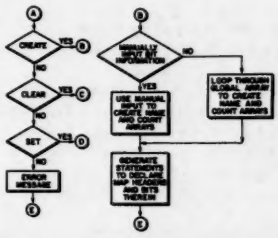
EMBEDDED TRACING METHOD FOR IDENTIFYING PROGRAM EXECUTED PATHS

Paul N. Andrews, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1988, Ser. No. 227,844

Int. Cl.[5] G06F *11/10, 11/00*

U.S. Cl. 395—375 **5 Claims**



1. A data processing system comprising:

means for inputting data to and outputting data from the data processing system;

means for processing the data input to the system, said processing means coupled to said inputting and outputting means;

means for storing a program for enabling the machine executed operation of said processing means, said storing means coupled to said processing means; and

a program having a plurality of branch points comprising:

means for inserting a plurality of embedded trace points, each trace point being logically located near a predetermined one of the plurality of branch points;

means for creating at least one bit map having a plurality of separately accessible bits, each of the bits logically associated with one of the trace points such that there is a one-to-one correspondence between the bits and the trace points, whereby each bit represents the status of the corresponding trace point;

means for placing each of the bits in a known state; and

means for setting the state of a bit to a referenced state when a respective logically associated trace point is referenced during a tracing interval, only one bit being set per referenced trace point.

5,067,074

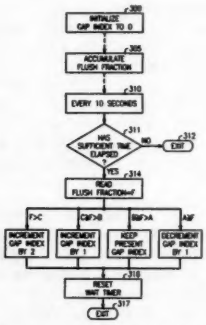
CONTROL OF OVERLOAD IN COMMUNICATIONS NETWORKS

Richard A. Farel, Englishtown, and Mohan Gawande, East Windsor, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 27, 1989, Ser. No. 428,268

Int. Cl.[5] H04M *11/00*

U.S. Cl. 395—200 **15 Claims**



1. In a first system for controlling a gap in a plurality of second systems using gap control to reject overload communication traffic, a method of controlling said gap for said second systems comprising:

in the first system, initializing an indication of a gap value;

measuring a fraction of communication traffic that cannot be processed in the first system;

responsive to said measuring, adjusting the value of the gap upward if the fraction exceeds a first threshold, downward, but not below zero, if the fraction is less than a second threshold and maintaining the value of the gap if the fraction is between the first and second threshold;

transmitting the value of the adjusted gap to the second system;

repeating the measuring, adjusting, and transmitting steps recurrently.

5,067,075

METHOD OF DIRECT MEMORY ACCESS CONTROL

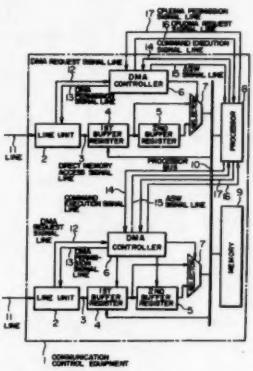
Minoru Sugano; Akira Horiki, both of Yokohama; Zenichi Yashiro, Iruma, and Hironori Matsushima, Sapporo, all of Japan, assignors to Hitachi, Ltd. and Nippon Telegraph & Telephone Corp., both of Tokyo, Japan

Filed May 10, 1988, Ser. No. 192,133

Claims priority, application Japan, May 13, 1987, 62-114684

Int. Cl.[5] G06F *13/28*

U.S. Cl. 395—425 **9 Claims**



1. For use in a system comprising an input/output device, a memory, a processor for controlling said input/output device and said memory, a processor bus connected to said memory and said processor and means connected between said input/output device and said processor bus for temporarily storing direct memory access information which is to be stored in said memory, a method of controlling direct memory access from said input/output device to said memory via said processor bus, comprising the steps of:

receiving and storing direct memory access information from said input/output device into said temporary storing means via a signal line having a significant delay; thereafter

requesting from said processor a right to usage of said processor bus for transmission of direct memory access information after said direct memory access information is stored in said temporary storing means; and

transmitting all of the direct memory access information stored in said temporary storing means to said processor bus for storage in said memory.

5,067,076

CIRCUIT ARRANGEMENT FOR SERIAL DATA TRANSFER

Hartmut Hantsch, Bad Friedrichshall; Peter Thoma, Hollern, and Josef Mahalek, Neufahrn, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich and Telefunken Electronic GmbH, Heilbronn, both of, Fed. Rep. of Germany

Continuation of Ser. No. 323,203, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 940,396, Dec. 11, 1986, abandoned. This application Apr. 15, 1991, Ser. No. 685,179

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3645293

Int. Cl.[5] H04J *3/08*

U.S. Cl. 395—275 **11 Claims**

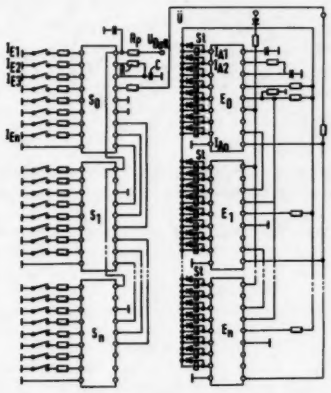
1. Circuit arrangement for parallel-serial-parallel data transfer, comprising:

a cascaded plurality of transmitting means, which are similar, coupled to a plurality of cascaded receiving means, which are similar, by a serial data transfer line, each of

said transmitting means receiving a respective plurality of bit-parallel input information units and converting them into serial data in the form of a corresponding data block, and each of said receiving means correspondingly converting serial data into a plurality of bit-parallel output information units;

said cascaded plurality of transmitting means being sequentially connected and producing serial data which is transferred on said serial data transfer line, said serial data being composed of data words, each data word having a start pulse, a plurality of information units corresponding to a predetermined number of bit-parallel input information units which together form a data block, and a defined data pause, wherein said predetermined number of bit-parallel input information units, which can be assembled into a data block, is determined by the number of cascaded transmitting and receiving means;

each of said transmitting means having internal clock means for producing an internal timing signal, a clock input terminal for receiving an external timing signal, and first master-slave-programming means, responsive to a control signal, for causing said transmitting means to operate as either a transmitting means master stage or a transmitting means slave stage such that each data word on said data transfer line is formed by sequential joining of a corresponding number of data blocks each having the same number of information units, said first master-slave-programming means including first means for selecting one of said internal timing signal and said external timing signal, wherein each of said transmitting means operating as a transmitting means slave stage is responsive to said external timing signal, only one of said cascaded plurality of transmitting means being said transmitting means master stage and producing said control signal and said external timing signal for each said transmitting means slave stage, and said transmitting means master stage being responsive to said internal timing signal;



each of said receiving means having internal clock means for producing an internal timing signal, a clock input terminal for receiving an external timing signal, and second master-slave-programming means for causing said second master-slave-programming means to operate as either a receiving means master stage or a receiving means slave stage, said second master-slave-programming means including second means for selecting as said timing signal one of said internal timing signal and said external timing signal, only one of said cascaded plurality of receiving means being said receiving means master stage and producing said external timing signal for each said receiving means slave stage

each of said transmitting means further comprising first cascading circuit means operable in conjunction with said first master-slave-programming means for sequentially joining its corresponding data block to the ones of said data blocks on said data transfer line, said ones of said data blocks being respectively joined corresponding to the sequence in which said transmitting means are connected, said first cascading circuit means including an externally programmable storage means; and

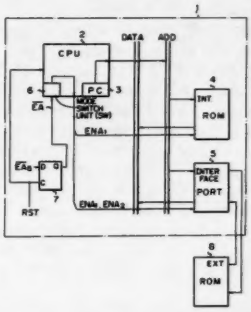
each of said receiving means further comprising second cascading circuit means operable in conjunction with said second master-slave-programming means for causing said data blocks to be respectively decoded by corresponding ones of said receiving means, said second cascading circuit means including a programmable storage device.

5,067,077

SINGLE CHIP MICROCOMPUTER HAVING UNAUTHORIZED MEMORY SPACE ACCESS PROTECTION

Yasuhiro Wakimoto, Yokohama, and Tetsuo Suzuki, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 285,310, Dec. 15, 1988, abandoned, which is a continuation of Ser. No. 652,074, Sep. 19, 1984, abandoned. This application Mar. 19, 1991, Ser. No. 671,660
Claims priority, application Japan, Sep. 22, 1983, 58-175977
Int. Cl.[5] G06F *12/00, 12/14*
U.S. Cl. 395—400 **8 Claims**



1. A single-chip microcomputer connectable to an external memory having first and second address spaces and comprising:

an internal read-only memory having said second address space;

a central processor, operatively connected to said internal read-only memory, operating in a first mode to access said internal read-only memory and said first address space of said external memory and a second mode to access said first and second address spaces of said external memory said central processor including:

a program counter for generating an address used to access said external memory, and

switching means for switching, in response to a switching signal, between the first mode and the second mode; and

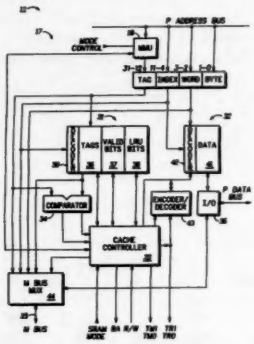
inhibiting means, connected to said switching means, for receiving an input the switching signal and the address generated by said program counter, and for inhibiting, when the address is in said first address space only, output of said switching signal as input to said switching means to prevent switching from said second mode to said first mode.

5,067,078

CACHE WHICH PROVIDES STATUS INFORMATION

Yoav Talgam, Tel-Aviv, Israel; James A. Klingshirn, and James B. Gullette, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 17, 1989, Ser. No. 339,464
Int. Cl.[5] G06F *7/00, 7/04, 7/20;* G11C *8/00*
U.S. Cl. 395—400 9 Claims



1. An integrated circuit cache, having an address bus for receiving processor addresses from a processor, a data bus for providing requested data to the processor, and a multiplexed bus for accessing a main memory using memory addresses, said processor addresses and said memory addresses having a TAG portion and an index portion, comprising:

a TAG memory, coupled to the address bus, having a plurality of valid bits and a plurality of TAG locations for storing a plurality of TAG addresses, each TAG location having a valid bit of the plurality of valid bits associated therewith, said TAG locations characterized as being arranged in sets of TAG locations, each set of TAG locations corresponding to a particular index portion;

a data memory, coupled to the address bus, having a plurality of storage locations for storing data, wherein said stored data may be invalid, each storage location corresponding to a TAG location of the plurality of TAG locations, and to a valid bit of said plurality of valid bits for indicating if data stored in the storage location is invalid;

determination means, coupled to the TAG memory and to the address bus, for determining if the TAG portion of the processor address present on the address bus corresponds to a TAG address present in the selected set of TAG locations which correspond to the index portion of the processor address and providing a TAG select signal to the data memory to indicate which one of the TAG locations of the selected set of TAG locations contains the TAG portion of the processor address;

output means, coupled to the TAG memory, for providing, onto the multiplexed bus, the memory address with the TAG portion having the TAG address of one of the TAG locations of the set of TAG locations which corresponds to the index portion of the memory address; and

cache controller means, coupled to the output means, for providing a plurality of trace signals and status signals external to said cache integrated circuit, said plurality of status signals indicating if the valid bit which corresponds to the TAG location of the TAG address which is provided on the memory bus is set, and said trace signals indicating which one of the TAG locations of the set of TAG locations corresponding to the index portion of the memory address on the memory address has its TAG address on the multiplexed bus; and

wherein said integrated circuit cache has a plurality of monitor states which comprise:

a first state, in which said integrated circuit cache performs a memory cycle on the multiplexed bus for which an address TAG is being validated;

a second state, in which said integrated circuit cache performs a memory cycle on the multiplexed bus for which an address TAG is being invalidated; and

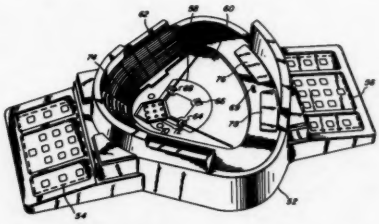
a third state, in which said integrated circuit cache performs a memory cycle on the multiplexed bus for which an address TAG is not affected.

5,067,079

INTERACTIVE AUDIO BASEBALL GAME

Jay Smith, III, Los Angeles, and Jeffrey W. Fort, Santa Barbara, both of Calif., assignors to Smith Engineering, Culver City, Calif.

Filed Feb. 6, 1989, Ser. No. 307,301
Int. Cl.[5] G06F *15/44;* A63F *9/00, 7/06*
U.S. Cl. 364—410 15 Claims



1. A microprocessor based interactive audio baseball game having a predetermined number of possible game states comprising:

visual means for designating the path of a ball thrown with a pitch game play and for producing a flashing visual output representative of the path of the simulated flight of the thrown ball and the time interval during which a hit game play may take place, said visual means comprising a plurality of visual indicators arranged in a grid that represents the flight of a thrown ball through a vertical cross section of the strike zone, said visual indicators being sequentially flashed a predetermined number of times and in a predetermined pattern for a particular variety of pitch, said predetermined number of flashes indicating the time interval during which the hit game play may take place and said predetermined pattern indicating the path of the simulated flight of the thrown ball;

input means for at least one participant to vary the state of the game, said input means including a grid of keys corresponding to said plurality of visual indicators arranged in a grid whereby said participant, by depressing an appropriate one of said keys, may simulate a swing at a particular time and through a particular location in response to a simulated pitch;

audio means for providing to the participant an audio output indicative of a particular game state, and

means for variably selecting one of a plurality of audio outputs which correspond to a particular game state whereby the participant is provided with a variety of different audio outputs for the same game state.

9. An audio baseball game where the play of the game is affected by a combination of major league baseball player' statistics and at lease one user's directions comprising:

means for storing and retrieving pitcher and batter statistical sets;

game play processing means for simulating the game plays of a baseball game based upon the statistical sets and for producing output results, said game plays comprising pitching, batting, and base running game plays;

visual means for indicating the position of a simulated ball thrown in the pitching game play, said visual means comprising a uniform grid of visual indicators that are sequentially flashed, the number of flashed visual indicators representing a simulated position between the pitcher and home plate and the pattern defined by the flashed visual indicators representing a simulated position from the catcher's viewpoint;

input means for allowing at least one user to direct the play of the game play processing means in conjunction with the statistical sets, to thereby affect the output results;

said input means including a grid of keys corresponding to said uniform grid of visual indicators whereby said participant, by depressing an appropriate one of said keys, may simulate a swing at a particular time and through a particular location in response to a simulated pitch; audio means for vocalizing a particular output result whereby the user is provided with a vocal description of the game play.

5,067,080

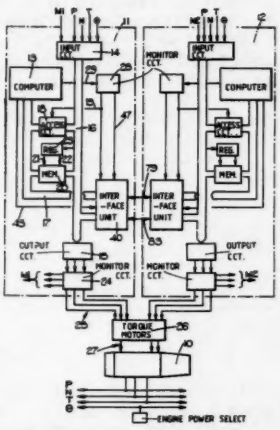
DIGITAL CONTROL SYSTEM

Brian F. Farman, Endicott, N.Y., assignor to Lucas Industries Public Limited Company, Birmingham, England

Continuation of Ser. No. 780,930, Apr. 11, 1985, abandoned. This application Jan. 4, 1988, Ser. No. 143,240

Int. Cl.[5] G06F *15/48*

U.S. Cl. 364—431.04 **11 Claims**



1. A digital control system having two control lanes which are selectively operable to control an apparatus, each lane comprising:

a digital computer;

input and output devices;

an input-output bus for connecting said devices to said computer;

means responsive to selection of that lane as inoperable to control said apparatus for isolating said computer from said input-output bus; and

an interface unit, said interface unit including;

means, responsive to a signal selecting that lane as operable to control said apparatus, for transmitting data from said computer to the input-output bus in the other lane and for receiving data from the input-output bus in said other lane;

means, responsive to a signal selecting that lane as inoperable to control said apparatus, for transmitting data from said input-output bus to the computer in said other lane, and for receiving data from the computer in said other lane;

means for generating an indicating signal for separate groups of data transmitted; and

means responsive to indicating signals from the other lane for generating control signals for handling an indicated data group from that other lane.

5,067,081

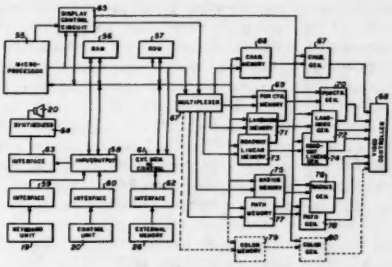
PORTABLE ELECTRONIC NAVIGATION AID

Carl E. Person, 221 W. 41st St., New York, N.Y. 10036

Filed Aug. 30, 1989, Ser. No. 400,324

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—444 **31 Claims**



1. A portable electronic navigation apparatus utilizing universal latitude and longitude coordinates for determining current location or a specific destination and the distance and bearing thereof relative to landmark data input by a user comprising:

a portable housing;

a microcomputer contained within said housing including; a first memory having stored navigational data representing the identity and latitude and longitude coordinates for the approximate physical center of various points or landmarks in a geographical area to be navigated, a second memory having stored calculation programs to calculate differences in latitude and longitude coordinates, convert the calculated differences to mileage and determine the bearing or direction between the latitude and longitude coordinates, a temporary memory for temporarily storing data in the course of computation, a video display controller, input and output ports, and a central processing unit responsive to user input to control the operation of said memories, said input and output ports, and said video display controller;

a video display screen operatively connected to said microcomputer video display controller;

a keyboard operatively connected to said microcomputer and having user input keys for inputting data and operation control keys for controlling the operation of said microcomputer;

power connection means operatively connected to said microcomputer for connecting said microcomputer to a source of electrical power,

external memory receiving means operatively connected to said microcomputer for removably receiving external memory means,

external memory means removably received within said external memory receiving means and having additional stored navigation data representing the identity and latitude and longitude coordinates for the approximate physical center of various points or landmarks in a geographical area to be navigated,

said navigational data being read from said first memory said external memory means into said temporary memory and processed by said central processing unit responsive to user input from said keyboard and calculated by said programs in said second memory relative to other data inputted by the user and the results of the calculations displayed on said video display screen by said video controller, whereby

upon the user typing in a destination location said microcomputer records the destination location in said tem-

porary memory and retrieves from said first memory or said external memory means the identity of the destination location and its latitude and longitude coordinates and displays the retrieved information on said video display screen or indicates that the destination location does not exist in said first memory or said external memory means, and the user can selectively edit the retrieved information or add the destination location data by typing in the identity or latitude and longitude coordinates for the destination location and record the edited data in said temporary memory, and

upon the user typing in a starting location or a current location said microcomputer records the starting location or current location in said temporary memory and retrieves from said first memory or said external memory means the identity of the starting location or current location and its latitude and longitude coordinates and displays the retrieved information on said video display screen or indicates that the starting or current location does not exist in said first memory or said external memory means, and the user can selectively edit the retrieved information or add the starting location or current location data by typing in the identity or latitude and longitude coordinates for the starting location or current location and record the edited data in said temporary memory, and

after the destination location and starting location or current location data have been entered into said temporary memory, the user presses a key to cause one of said programs in said second memory to calculate the differences between the latitude and longitude coordinates of the destination location and the starting location or current location, convert the calculated differences to mileage, determine the bearing or direction from the starting location to the destination location, and display the mileage and bearing or direction from the starting location to the destination location on said video display screen.

5,067,082

NAVIGATION APPARATUS

Mitsuhiro Nimura; Akimasa Nanba, and Shoji Yokoyama, all of Anjo, Japan, assignors to Aisin AW Co., Ltd. and Kabushiki Kaisha Shinsangyokaihatsu, both of, Japan

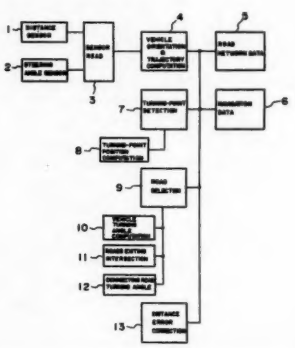
PCT No. PCT/JP88/01300, § 371 Date Aug. 23, 1989, § 102(e) Date Aug. 23, 1989, PCT Pub. No. WO90/01679, PCT Pub. Date Feb. 22, 1990

PCT Filed Dec. 23, 1988, Ser. No. 408,504

Claims priority, application Japan, Aug. 11, 1988, 63-202473; Aug. 11, 1988, 63-202475

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—449 **6 Claims**



1. A navigation apparatus for a vehicle which, by being provided with an input of a desired destination, performs course exploration up to the destination to furnish a course to the destination while keeping track of present position of the vehicle, said apparatus comprising:

storage means for storing road network data including road network information having intersections as reference points,

means for detecting the steering angle of the vehicle,

means for detecting the travel distance of the vehicle,

computing means for computing the vehicle orientation and trajectory from said detected steering angle and said detected travel distance,

turning-point detecting means for detecting a turning point from said detected steering angle and said computed vehicle orientation and computing the position of the turning point, and

road selecting means for determining an actual vehicle turning angle from the turning-point position and comparing the actual vehicle turning angle with the turning angle of a road leading to an intersection obtained from the road network data, and selecting a road in a travelling direction which passes through the intersection based on the comparison,

wherein said vehicle turning angle is determined based on three points, namely, the turning-point position, the turn starting point and the turn end points, and said present position is calculated based on the selected road in the travelling direction and intersection information.

5,067,083

VEHICLE DRIVING AZIMUTH DETECTING APPARATUS FOR CORRECTING A DISTURBED GEOMAGNETIC AZIMUTH

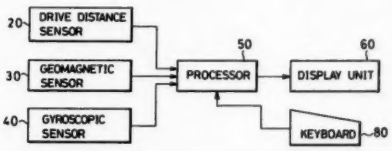
Okihiko Nakayama, Kamakura, and Hiroshi Tsuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 28, 1989, Ser. No. 316,836

Claims priority, application Japan, Feb. 29, 1988, 63-47189

Int. Cl.[5] G06F *15/50*

U.S. Cl. 364—453 **5 Claims**



1. An apparatus for detecting a present driving azimuth of a vehicle, said apparatus comprising:

a geomagnetic sensor which senses a plurality of geomagnetic azimuth values of said vehicle to produce a first geomagnetic variation amount in said plurality of geomagnetic azimuth values;

a gyroscopic sensor which senses a plurality of gyroscopic azimuth values of said vehicle to produce a second gyroscopic variation amount in said plurality of gyroscopic azimuth values;

a processor which determines a geomagnetic condition surrounding said vehicle by calculating a difference between said first geomagnetic variation amount and said second gyroscopic variation amount and outputs a geomagnetic condition signal representative of geomagnetic conditions surrounding said vehicle, said processor also determining said present driving azimuth of said vehicle based on said difference between said first geomagnetic variation amount and said second gyroscopic variation amount and on said geomagnetic condition signal such that a plurality of differences of said first geomagnetic variation amount and said second gyroscopic variation amount are acquired and averaged to obtain an averaged difference according to

$$\beta = \sum_{1}^{M} |\Delta\theta_G - \Delta\theta_M|/M,$$

where M is a number of azimuth detections ($M \geqq 2$), $\Delta\theta_G$ is said second gyroscopic variation amount, and, $\Delta\theta_M$ is said first geomagnetic variation amount and said present driving azimuth θ_3 is generated according to

$$\theta_3 = \{\alpha/(\beta^n + 1)\} \cdot (\theta_M - \theta_2) + \theta_2,$$

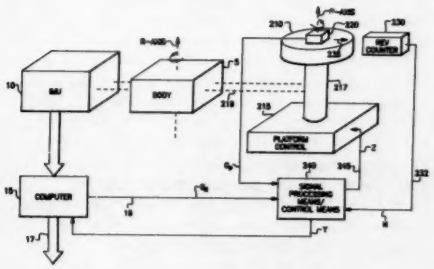
where α is a first constant ($0 \leqq \alpha \leqq 1$), n is a second constant, θ_M is said geomagnetic azimuth, and θ_2 corresponds to $\Delta\theta_G + \theta_3$ acquired in a previous azimuth detection.

5,067,084

INERTIAL MEASUREMENT UNIT WITH AIDING FROM ROLL ISOLATED GYRO

Shing P. Kau, Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 25, 1989, Ser. No. 357,383
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—453 **3 Claims**



1. An inertial measurement apparatus comprising:

an inertial measurement unit having at least a first rotation sensor for providing a first rotation signal indicative of rotation of a vehicle body about a first axis, said first rotation sensor being rigidly secured relative to said vehicle body;

a rotatable platform having a platform rotation axis;

a platform control means for controlling the rate of rotation of said rotatable platform about said platform rotation axis, and in which the axis is substantially in parallel with such vehicle body axis in response to a first control signal;

a second rotation sensor originally fixed to said platform, said second rotation sensor having a sensing input axis substantially in parallel with such vehicle body axis, said second rotation sensor further providing a second rotation signal indicative to rotation of said second rotation sensor about said platform rotation axis;

means for counting complete revolutions of said rotatable platform and providing a count signal representative of said complete revolutions;

signal processing means responsive to said first rotation signal and said second rotation signal to provide said first control signal such that said rotatable platform turns at a rate of rotation substantially equal to said rotation of said vehicle body about said first axis, but in an opposite direction; and

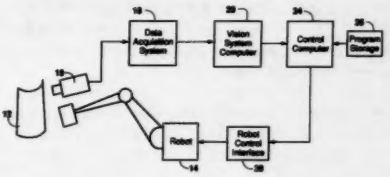
said signal processing means for generating an error signal as a function of said first rotation signal, said second rotation signal, and said count signal, and said error signal being related to rotation measurement error of said first rotation signal due to high spin rates of said inertial measurement apparatus.

5,067,085

OPTICAL ROBOTIC CANOPY POLISHING SYSTEM

Dennis J. Wenzel, and David S. McFalls, II, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed May 15, 1989, Ser. No. 352,600
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.06 **11 Claims**



1. A system for removing flaws from the surface of a material, such as a transparent aircraft canopy, comprising:

a canopy;

means for obtaining a video signal representation of the surface of said canopy, wherein said means for obtaining a video signal representation of said canopy comprises means for mapping said surface of said canopy to obtain a plurality of mapped sectors, the location of said flaws being correlated with the location of said mapped sectors;

means for processing said video signal representation of said surface of said canopy to locate flaws in said surface;

means for determining an optimal grinding pattern for removing said flaws from said canopy; and

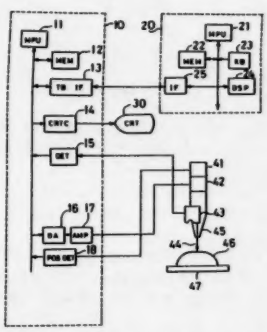
means for polishing the surface of said canopy in accordance with said grinding pattern to remove said flaws from said surface.

5,067,086

THREE-DIMENSIONAL SHAPE MACHINING LASER DEVICE

Etsuo Yamazaki, Hachioji, and Nobuaki Iehisa, Minamitsuru, both of Japan, assignors to Fanuc, Ltd., Minamitsuru, Japan

PCT No. PCT/JP89/00005, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/06174, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 6, 1989, Ser. No. 397,460
Claims priority, application Japan, Jan. 8, 1988, 63-002143
Int. Cl.[5] G06F *15/46;* B23K *26/02*
U.S. Cl. 364—474.08 **4 Claims**



1. A three-dimensional shape machining laser device for performing three-dimensional machining of a work using a nozzle, comprising:

means for generating NC commands relating to X, Y and Z axes and a pose of the nozzle;

command storage means for storing the NC commands;

NC command execution means for executing the NC commands;

sensor means for detecting a distance between the distal end and the work;

tracing means for controlling the distance between the nozzle and the work to a predetermined value in accordance with the distance detected by said sensor means;

interrupt control means for performing tracer control during execution of the NC commands, for detecting a deviation of the distal end from a path defined by the NC commands, and for interrupting the execution of an NC command program when an amount of said deviation exceeds a predetermined value;

correction value calculation means for calculating correction command values used for correcting coordinate values of the X, y and Z axes, based on the amount of deviation, the coordinate values and pose data of the nozzle; and

correction means for correcting NC command values in accordance with said correction command values.

5,067,087

COMPOSITE-FIGURE DEFINITION METHOD

Masaki Seki; Takashi Takegahara, both of Tokyo, and Takeshi Arakaki, Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

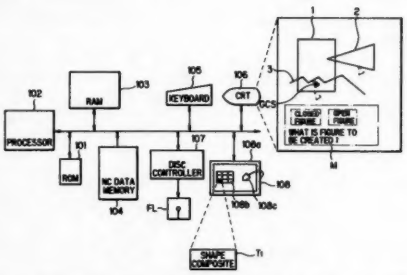
PCT No. PCT/JP88/01262, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/06006, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 13, 1988, Ser. No. 415,235

Claims priority, application Japan, Dec. 21, 1987, 62-323425

Int. Cl.[5] B23Q *15/22*

U.S. Cl. 364—474.24 **11 Claims**



1. A composite-figure definition method for combining already defined first and second figures to define a new figure, characterized by:

designating said first and second figures;

determining whether said designated first and second figures have a point of intersection;

displaying an error if there is no point of intersection;

determining whether at least one of said designated first and second figures is an open figure if there is a point of intersection;

successively painting closed figures, which are obtained by combining said designated first and second figures, if neither of said designated first and second figures is an open figure; and

when a desired closed figure is painted, selecting said closed figure, thereby defining the composite figure.

5,067,088

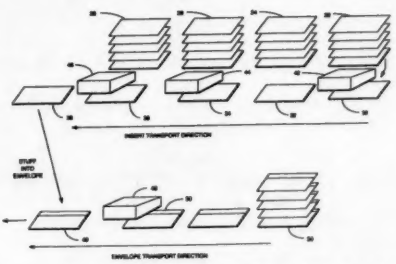
APPARATUS AND METHOD FOR ASSEMBLING MASS MAIL ITEMS

Edward M. Schneiderhan, Glenview, Ill., assignor to Johnson & Quin, Inc., Niles, Ill.

Filed Feb. 16, 1990, Ser. No. 481,480

Int. Cl.[5] G06F *15/20;* **B65H** *39/02*

U.S. Cl. 364—478 **8 Claims**



1. A matching system for use with an inserting device adapted to insert into an envelope component at least one mail component, a plurality of the components personalized for a predetermined recipient, said matching system comprising:

a plurality of video cameras, each of said cameras positioned to sense an alpha-numeric sequence indicator on a corresponding one of said personalized components, creating an electrical signal in accordance with the sensed indicator, the sequence indicator corresponding to the predetermined recipient for whom that component is personalized

means for processing the electrical signal from each of said cameras to develop a digital representation of that signal and for storing said digital representation; and

control means for receiving said stored digital representations and for determining therefrom whether the sequence indicators on the personalized components match.

5,067,089

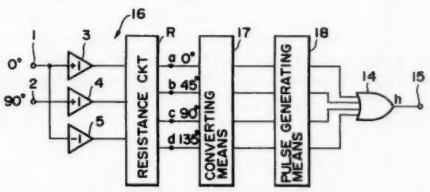
DEVICE HAVING SIGNAL INTERPOLATION CIRCUIT AND DISPLACEMENT MEASURING APPARATUS COMPRISING THE DEVICE

Satoshi Ishii; Masaaki Tsukiji, both of Tokyo; Tetsuharu Nishimura, Kawasaki, and Koh Ishizuka, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1989, Ser. No. 419,705

Int. Cl.[5] G01R *29/02;* **H03M** *1/48*

U.S. Cl. 364—486 **20 Claims**



5. A device comprising:

output means for receiving signals having predetermined phases and outputttting first and second signals having different phase angles and amplitudes;

a first comparator, having a first hysteresis settable to a first width, for converting said first signal into a first binary signal;

a second comparator, having a second hysteresis settable to a second width, for converting said second signal into a second binary signal, the first and second hysteresis

widths being set so that said first and second binary signals have substantially equal widths regardless of a difference in amplitude of said first and second signals; and

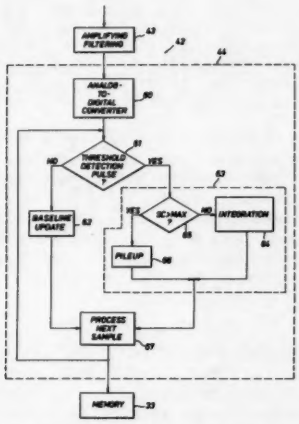
generating means for generating first and second pulses according to the phase angles on the basis of said first and second binary signals.

5,067,090

NUCLEAR SPECTROSCOPY METHOD AND APPARATUS FOR DIGITAL PULSE HEIGHT ANALYSIS

Bronislaw Seeman, Missouri City, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed May 1, 1989, Ser. No. 344,729
Int. Cl.[5] G01R *29/02*; G06F *15/52*
U.S. Cl. 364—486 27 Claims



1. A nuclear spectroscopy method for pulse height analysis of an electrical signal containing pulses representative of nuclear particles, the amplitude of said pulses being a measure of the energy of said nuclear particles, said method comprising the following successive steps:

(1) detecting said particles and forming an electrical signal containing pulses representative of said particles;

(2) continuously converting said signal to digital samples, at a given rate;

(3) determining whether said digital sample is representative of a pulse, and forming a digital image of each pulse; and

(4) sorting said digital images into a plurality of channels according to the energy of the corresponding particles.

5,067,091

CIRCUIT DESIGN CONVERSION APPARATUS

Masahisa Nakazawa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

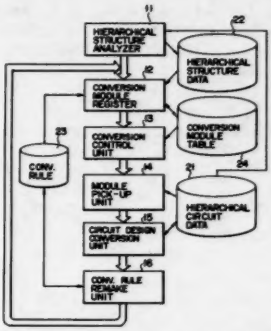
Filed Jan. 19, 1989, Ser. No. 298,909
Claims priority, application Japan, Jan. 21, 1988, 63-11382; Mar. 31, 1988, 63-76092; Nov. 7, 1988, 63-279301
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—490 14 Claims

1. A circuit design conversion apparatus responsive to circuit connection data representing connection between modules of a circuit with an hierarchical structure, hierarchical structure data representing the hierarchical structure of the circuit, and a conversion rule indicating a scannable module of the circuit, comprising:

means for providing a conversion module table representing modules higher in level than the scannable module indicated by the conversion rule, in accordance with the hierarchical structure data and the conversion rule, the table including a pointer indicating the module to be scan-design-converted;

circuit design converting means for converting the circuit connection data of the module indicated by the pointer of said conversion module table into a scannable design; and

updating means for adding the name of the module which



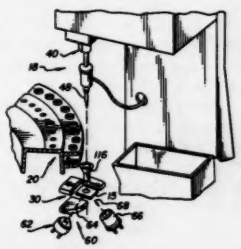
is scan-design-converted into said conversion rule, adding the name of the module higher in level than the module which is scan-design-converted into said conversion module table, and shifting the pointer of said conversion module table in accordance with the name of the module which is scan-design-converted.

5,067,092

PRESPOT DETECTION METHOD AND APPARATUS IN AN ANALYZER

J. Eric Hamann, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1990, Ser. No. 469,860
Int. Cl.[5] G01N *35/00, 33/18*
U.S. Cl. 364—496 5 Claims



1. A method of detecting improper wetting of a test element by a liquid dispenser using a wetness detector that produces an R-C time decay curve of reflectivity measured using an absorption wavelength of water that decreases abruptly if moisture is present on the element, the method comprising the steps of:

a) prior to intended liquid dispensing, generating an R-C time decay signal of data points representing reflectivity of a test element at said absorption wavelength of water,

b) for each data point in said signal, calculating an estimated first and second derivative of said signal over time,

c) comparing said second derivative for each data point against a threshold noise value representing the second derivative caused by motion of a test element,

d) determining if comparison step c) produces a value greater than said threshold value for two consecutive data points,

e) issuing an error statement if step d) finds such two consecutive data points producing a value greater than said threshold, and

f) redoing the assay of the test element in the event step e) results in the execution of an error statement.

5,067,093

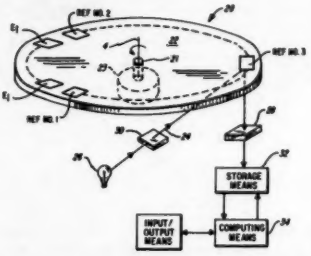
REFERENCE READING IN AN ANALYZER

Catherine S. Przybylowicz, Rochester; Edwin W. Brill, Jr., Pittsford, and Luigi A. Carrozziere, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1990, Ser. No. 469,887

Int. Cl.[5] G01N *21/55*; G06F *15/20*

U.S. Cl. 364—498 **8 Claims**



1. In a method for quantitatively assaying for an analyte in a biological liquid, comprising the steps of

a) scanning with a light beam a test element bearing a sample of liquid having an analyte of unknown concentration;

b) scanning a reference element with said light beam;

c) detecting the amount of light diffusely reflected from said test element and said reference element;

d) filtering the light beam before or after reflection from said elements and before detection, at a preselected wavelength that is the same for both said test element and said reference element;

e) storing the detected amounts of diffuse reflection for each scanning of the reference element and test element, and

f) comparing the detected reflectance of the test element with said stored reference detected reflectance to determine how much analyte is present, said reference element being scanned repeatedly, each time for a predetermined multiple of test elements scanned, a reference reflectance value being stored for each scanning;

the improvement wherein said step e) comprises the steps of always selecting from said stored reference reflectance detections at said wavelength that which is either detected by step c) at a point of time closest to the time at which said test element is scanned at said wavelength in step a), or that which is computed to be the equivalent reference reflectance at the actual time the test element reflectance was read, and comparing said selected reference reflectance detection in said step f) with the detected test element reflectance, whereby the effect of drift in the reading of the reference element is minimized.

5,067,094

QUANTIFYING ISOLATION VALVE LEAKAGE

James K. Hayes, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 337,625, Apr. 13, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 552,330

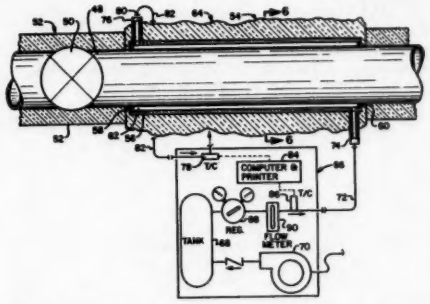
Int. Cl.[5] G01M *3/26*

U.S. Cl. 364—510 **30 Claims**

17. A system for measuring steam leakage through a steam isolation valve connected between an upstream pipe containing steam from a process condition and a downstream pipe at a known bypass condition, the pipes having tubular walls defining inner and outer surfaces between which heat is transferred when the surfaces are at respective inner and outer temperatures, the system comprising:

means for storing a quantitative relation between an index dependent on the heat transfer characteristics through the outer surface of the wall of the upstream pipe and steam leakage through the valve at a given process condition;

means secured to a selected outer surface of said upstream



pipe for measuring a thermal variable on said pipe which is dependent on said heat transfer characteristics;

means for generating a heat transfer index signal from the measured thermal variable;

processor means responsive to the index signal and coupled to the means for storing a quantitative relation for computing steam leak rate from said quantitative relation; and

means for recording the computed leak rate.

5,067,095

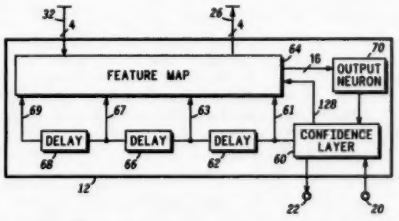
SPANN: SEQUENCE PROCESSING ARTIFICIAL NEURAL NETWORK

William M. Peterson, Scottsdale; Howard C. Anderson, Tempe; Robert Leivian, Chandler, and Sidney C. Garrison, Tempe, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 9, 1990, Ser. No. 462,203

Int. Cl.[5] G06G *7/12*

U.S. Cl. 395—24 **34 Claims**



1. A neural network responsive to first and second input signals applied at first and second inputs for providing first and second output signals at first and second outputs symbolic of the information content thereof, comprising:

first means responsive to the first output signal for providing a prediction of the first input signal of the neural network at an output;

second means having first and second outputs and first and second inputs coupled for receiving the first input signal of the neural network and said prediction of the first input signal respectively for monitoring the correlation between the first input signal and said prediction of the first input signal and gating a signal through said second means to said first output of said second means in response to first and second degrees of correlation between the first input signal and said prediction of the first input signal, wherein the first input signal is gated through to said first output of

said second means upon detecting said first degree of correlation and said prediction of the first input signal is gated through to said first and second outputs of said second means upon detecting said second degree of correlation, said second output of said second means being coupled to the second output of the neural network;

third means for progressively delaying said signal gated through said second means to provide a spatial vector of said signal gated through said second means at a plurality of tap points; and

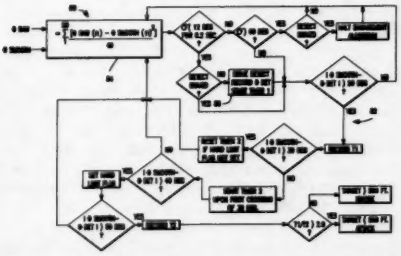
fourth means responsive to said spatial vector of said signal gated through said second means and to the second input signal of the neural network for providing the first output signal symbolic of the information content of the first and second input signals.

5,067,096

TARGET ENGAGEMENT SYSTEM FOR DETERMINING PROXIMITY TO A TARGET

David P. Olson, Mound, and Jonathan C. Werder, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 14, 1990, Ser. No. 582,574
Int. Cl.[5] G01S *15/00*
U.S. Cl. 364—517 **21 Claims**



20. A method for engaging a target, comprising the steps of:

(a) receiving an azimuth signal including a target bearing and an average target bearing;

(b) waiting until the standard deviation of the target bearing and the average target bearing is less than a predetermined first deviation limit;

(c) recording the target bearing;

(d) measuring a first time interval as the time it takes for the target to move through a predetermined first bearing angle; and

(e) measuring a second time interval as the time it takes for the target to move through a predetermined second bearing angle; and

(f) engaging said target if the ratio of said first time interval to said second time interval is greater than a predetermined ratio.

5,067,097

IMAGE MEMORY CONTROLLER

Hideki Yamazaki, Hitachi; Hiroshi Takeda, Higashi-yamamato, and Yoshikazu Yokota, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

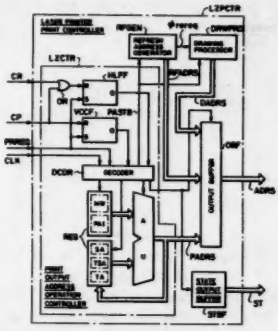
Continuation of Ser. No. 173,355, Mar. 25, 1988, abandoned.
This application Mar. 8, 1990, Ser. No. 494,874
Claims priority, application Japan, Mar. 27, 1987, 62-71441
Int. Cl.[5] G06F *15/626*
U.S. Cl. 395—115 **20 Claims**

6. An image memory controller comprising:

a state designation signal generation means coupled to a printer, said generation means generating at least two state designation signals including a print address output request signal, a page changing signal representing a change in a page of paper to be printed upon by the printer, and a line changing signal representing a change of a line to be printed by the printer;

first address signal generation means for generating a first address signal in response to at least one of the state designation signals representing the operation state of printer disposed in such a manner as to correspond to an image memory;

second address signal generation means for generating a refresh second address signal for said image memory;



third address signal generation means for generating a third address signal used for rewriting at least part of data stored in said image memory; and,

address signal selection means for sending selectively any of said first, second and third address signals to said image memory.

5,067,098

SLOPE-ASPECT COLOR SHADING FOR PARAMETRIC SURFACES

Harold J. Moellering, Columbus, Ohio, and A. Jon Kimerling, Corvallis, Oreg., assignors to The Ohio State University Research Foundation, Columbus, Ohio

Filed Mar. 31, 1989, Ser. No. 331,929
Int. Cl.[5] G06F *15/62*; G09B *29/12*; G09G *5/02*
U.S. Cl. 395—126 **13 Claims**

12. A method for generating an image on a two dimensional surface representing a three dimensional surface which has been subdivided into an array of contiguous surface elements on a positional coordinate system, each element being defined by stored data including at least two positional coordinate parameters to define a position and a slope-aspect azimuth interval parameter for each position defining the direction the element faces, the image also having a selected light origin azimuth, the method comprising:

(a) effecting the radiation of light having the color yellow from all coordinate positions on the two dimensional surface having a slope-aspect interval identical to the light origin interval;

(b) effecting the radiation of light having the color blue from all coordinate positions on the two dimensional surface

having a slope aspect azimuth interval diametrically opposite the light origin azimuth interval;

(c) effecting the radiation of light having the color red from all coordinate positions on the two dimensional surface having one of the two slope aspect azimuth intervals which are orthogonal to the light origin azimuth interval; and

(d) effecting the radiation of light having the color green from the other of said two orthogonal intervals.

5,067,099

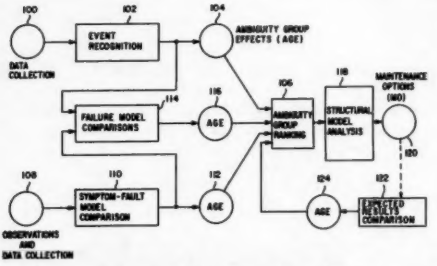
METHODS AND APPARATUS FOR MONITORING SYSTEM PERFORMANCE

Patricia M. McCown, Cresskill; Timothy J. Conway, Highland Park, and Karl M. Jessen, Bayonne, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 266,722, Nov. 3, 1988. This application Apr. 10, 1989, Ser. No. 335,464

Int. Cl.[5] G06F *15/74*

U.S. Cl. 364—550 **41 Claims**



27. Apparatus for monitoring a system's performance, comprising:

data acquisition means for collecting a plurality of operational data samples from the system during a period of operation;

an event record database for providing a plurality of event records, each of said plurality of event records pre-defining an event that can occur during operation of the system by those events on whose occurrence the occurrence of said pre-defined event is dependent and by one or more critical parameters defining operational data which must occur during the system's performance for said pre-defined event to occur, each of said plurality of event records further having a plurality of data defining actions to be performed;

event recognition means for accessing successive event records in said plurality of event records and for each of said plurality of event records, comparing said event on whose occurrence the occurrence of said event pre-defined by said event record is dependent and if a match is found, then comparing said one or more critical parameters to each successive operational data sample and if a match is found, recognizing said event pre-defined by said event record as having occurred;

means for accessing said event records which pre-define each of said recognized events and performing the specified action.

5,067,100

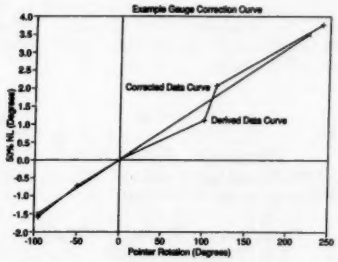
METHOD OF CALIBRATING MECHANICAL PRESSURE GAUGES

Robert D. Bissell, Orange, and Nicholas E. Ortyl, III, Middletown, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 22, 1990, Ser. No. 570,913

Int. Cl.[5] G01L *7/04;* G06F *15/46*

U.S. Cl. 364—571.01 **22 Claims**



1. Method of calibrating pressure gauges having a pressure responsive element which moves proportionate to applied pressure, the element being unrigidly linked at a gain producing span adjusting distance from the pivot point of a segment gear, the segment gear being pivoted in a movement drivingly engaging a pinion gear mounted in the movement to operate a dial indicating pointer shaft and pointer, the movement being rotatably positionable about the pointer shaft between maximum and minimum starting teeth engagement of the pinion gear with the segment gear, the method comprising:

(1) developing an analogue baseline model of a calibrated gauge linkage within design dimensions and design movement of the pressure responsive element from zero to full span pressure;

(2) manipulating the baseline model to selected segment angles representative of the possible starting positions of the pinion gear on the segment gear and determining deviation in percent non-linearity full scale from the baseline condition as a function of pointer rotation; and

(3) calibrating a pressure gauge by adjustment of the gain to span the gauge at full pressure followed by application of a reference pressure most selective of linkage non-linearity, applying the relationship developed in step (2) to determine pointer angle which is corrective of the linkage non-linearity found, unpressurizing the gauge, rotating the movement to produce the corrective pointer angle and replacing the pointer at zero.

5,067,101

TOPOGRAPHY SIMULATION METHOD

Tatsuya Kunikiyo; Masato Fujinaga, and Norihiko Kotani, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 21, 1989, Ser. No. 410,723

Claims priority, application Japan, Nov. 29, 1988, 63-302857

Int. Cl.[5] G06F *15/72*

U.S. Cl. 364—578 **2 Claims**

1. A method of predicting the three-dimensional shape of a surface of a workpiece from which material is removed by etching with an etchant comprising:

specifying a time T during which a workpiece will be exposed to an etchant;

establishing a three-dimensional grid of points;

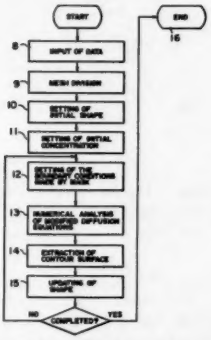
specifying an initial three-dimensional shape of a surface of the workpiece that will be exposed to the etchant at each point on the grid of points;

specifying the initial concentration of the etchant at the surface of the workpiece that will be exposed to the etchant;

specifying the three-dimensional diffusion coefficient of the etchant;

specifying the three-dimensional etching rate of the workpiece at each location corresponding to a point on the grid of points;

successively solving the modified three-dimensional diffusion model equations for each of a plurality of time intervals representing etching of the workpiece beginning from the specified initial three-dimensional shape of the surface of the workpiece at the beginning of the first interval, the initial etchant concentration, the three-dimensional diffusion coefficient of the etchant, and the three-dimensional etching rates of the workpiece at each point on the grid of points to determine the shape of the etched surface of the workpiece at the end of each interval from the shape of the etched surface of the workpiece at the beginning of that interval by the finite difference method until the total length of the time intervals reaches the specified time T, thereby producing the final shape of the etched surface of the workpiece after etching with the etchant for the time T; and



graphically displaying the shape of the workpiece after etching with the etchant for the time T.

5,067,102

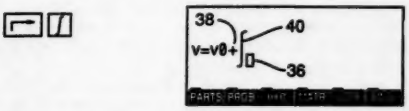
METHOD AND APPARATUS FOR DISPLAYING AND EDITING MATHEMATICAL EXPRESSIONS IN TEXTBOOK FORMAT

Gabe L. Eisenstein, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 31, 1990, Ser. No. 472,684

Int. Cl.[5] G06F *3/00*

U.S. Cl. 364—709.12 **10 Claims**



1. In a hand-held calculator having a display screen and keyboard, apparatus for displaying in textbook format a mathematical expression comprised of objects, comprising:

a plurality of keys for entering objects into the calculator to form a mathematical expression;

means responsive to a key press for displaying an object associated with the key in a nonlinear textbook format;

means for implicitly entering and displaying an object in response to entry of a predetermined pattern of objects; and

a cursor responsive to a currently entered object for indicating where a next object to be entered is displayed,

the displaying means further responsive to a currently entered object for controlling the display of the next object to maintain the textbook format of the expression.

5,067,103

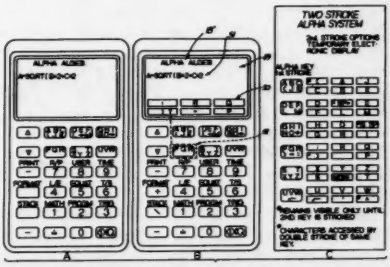
HAND HELD COMPUTERS WITH ALPHA KEYSTROKE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 248,127, Sep. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 60,225, Jun. 10, 1987, Pat. No. 5,008,847, which is a continuation-in-part of Ser. No. 844,872, Mar. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 729,559, May 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 459,998, Jan. 21, 1983, Pat. No. 4,547,860. This application Sep. 28, 1990, Ser. No. 590,325

Int. Cl.[5] G06F *3/023*

U.S. Cl. 364—709.16 **18 Claims**

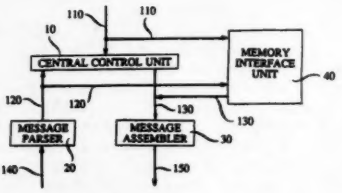


16. In a hand held multi-function alphanumeric computer with the capability of processing hundreds of data characters and alphanumeric command functions mounted in a housing having a common panel with a manual entry keyboard and a temporary display panel for displaying computer processed data indicia, the improvement comprising, means operable with said display panel to display alphanumeric data thereon in a plurality of lines of alpha characters, a limited number of keyboard keys divided into two mutually exclusive subsets of keys for entry respectively of decimal digits and alphabet characters, computer control means operable by the keyboard keys for selecting and automatically entering when selected a variety of computer input instructions and data input characters including a set of alphabetic characters in a two stroke per entry mode from said alphabet character subset of keys, computer operating means for controlling the keyboard and computer system means responding to keyboard keystroke entries to respond simultaneously to two keyboard input modes of operation, namely single stroke per entry for ten decimal digits from said subset of keys for decimal digits, and two stroke per entry for a set of alphabetic characters from said subset of keys for alphabet characters and computer data organization means for organizing and displaying on said temporary display panel in two mutually exclusive regions of the panel respectively (1) keystroke selection instructions in the multiple stroke per entry mode in the form of a multiple-choice chart identifying the functional response of individual keys in said alphabet character subset of keys on the keyboard to enter alphabetic characters in said set and (2) multiple line alphanumeric data messages processed by the computer in response to actuation of the keyboard keys.

5,067,104
PROGRAMMABLE PROTOCOL ENGINE HAVING CONTEXT FREE AND CONTEXT DEPENDENT PROCESSES

Anjur S. Krishnakumar, Warren; Bala Krishnamurthy, Morganville, and Krishan K. Sabnani, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 1, 1987, Ser. No. 45,904
Int. Cl.[5] H04J *3/12;* **G06F** *3/00, 13/10, 13/14*
U.S. Cl. 395—375 **13 Claims**



1. A protocol engine comprising:

a programmable message parser connected to a first interface, including a port for programming said message parser, and responsive to incoming message signals from said first interface for parsing said incoming message into outgoing message component signals;

a programmable message assembler, including a port for programming said message assembler, connected to said first interface for assembling incoming message component signals from an internal interface to form outgoing message signals for said first interface; and

a central control unit coupled to said message parser, to said message assembler at said internal interface, and to a second interface, for affecting communications between said first interface and said second interface by receiving said outgoing messages of said programmable message parser, modifying them in accordance with alterably installed transmission and signaling rules of a predefined protocol to develop a message packet and applying the message packet to said second interface, by receiving a message packet from said second interface, modifying it in accordance alterably installed with transmission and signaling rules of a predefined protocol to develop said incoming message component signals.

5,067,105
SYSTEM AND METHOD FOR AUTOMATICALLY CONFIGURING TRANSLATION OF LOGICAL ADDRESSES TO A PHYSICAL MEMORY ADDRESS IN A COMPUTER MEMORY SYSTEM

John M. Borkenhagen; Quentin G. Schmierer, and Charles P. Geer, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1987, Ser. No. 120,884
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—400 **7 Claims**

1. A method for automatically configuring the translation of a logical memory address to a physical memory address in a computer system, comprising the steps of:

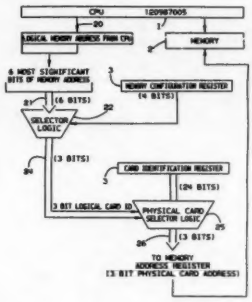
a. testing cards containing memory to identify those cards providing error free operation;

b. storing the physical addresses of the cards so tested and providing error free operation in a card identification register at locations corresponding to a logical address range;

c. reading identification data on said memory cards to determine the number of storage addresses on each card;

d. translating a first portion of the logical memory address to a logical card address based on the identification data;

e. accessing said register with said logical card address to obtain therefrom a physical card address; and

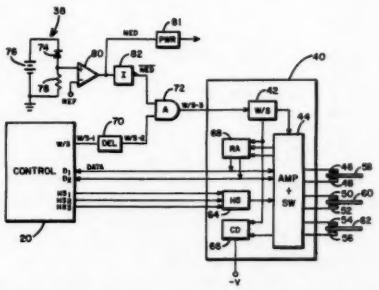


f. combining said physical card address with a second portion of said logical memory address to obtain therefrom a physical memory address.

5,067,106
RADIATION DETECTION AND SIGNAL DELAY CIRCUITRY FOR PROTECTING RECORDED DATA

Richard C. Pedersen, Burnsville; Richard M. Sedro, Roseville, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Sep. 5, 1989, Ser. No. 402,504
Int. Cl.[5] G06F *12/16*
U.S. Cl. 395—575 **18 Claims**



1. An apparatus for preserving the integrity of electronically recorded data in the event of exposure to radiation, including:

a memory for storing information and a data entry means operatively associated with said memory, said data entry means, when enabled, recording information onto said memory responsive to receiving electrical data signals representing said information;

a control means operatively associated with said data entry means for providing said electrical data signals to said data entry means and for generating a first control signal to enable said data entry means to record the information;

a signal transmitting element having alternative active and inactive states and operatively connected between the control means and the data entry means, said signal transmitting element providing an enabling signal to the data entry means when in the active state and receiving the first control signal, said signal transmitting element providing a disabling signal to said data entry means when in the inactive state;

a radiation detector for sensing radiation and for generating a second control signal responsive to sensing radiation of at least a predetermined level, and a means for electrically coupling the detector and signal transmitting element to

provide the second control signal to the signal transmitting element and thereby force the signal transmitting element into said inactive state; and

a radiation resistant delay means electrically coupled between the control means and the signal transmitting element; for delaying the propagation of the first control signal from the control means to the signal transmitting element, by a predetermined amount of time at least as long as the time for propagation of said second control signal from the radiation detector to the signal transmitting element.

5,067,107

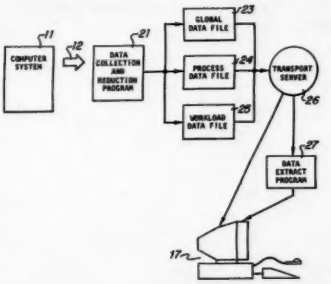
CONTINUOUS COMPUTER PERFORMANCE MEASUREMENT TOOL THAT REDUCES OPERATING SYSTEM PRODUCED PERFORMANCE DATA FOR LOGGING INTO GLOBAL, PROCESS, AND WORKLOAD FILES

Gerald T. Wade, Auburn, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 5, 1988, Ser. No. 229,573

Int. Cl.[5] G06F *11/34, 7/14, 15/401*

U.S. Cl. 395—500 **1 Claim**



1. A performance and measurement system embedded within a computing system for measuring performance of the computing system, the performance and measurement system comprising:

performance data production means within an operating system of the computing system for producing performance data;

at least one data file; and

data collection and reduction means, coupled to the performance data production means and to the at least one data file, for receiving the performance data, reducing the performance data into standardized metrics to produce reduced data, and logging the reduced data into the at least one data file; and

wherein said at least one data file comprises

a global data file into which said data collection and reduction means logs information about the computing system as a whole;

a process data file into which said data collection and reduction means logs information about selected processes selected by the data collection and reduction means, wherein said selected processes include processes which during a specified interval are terminated, and processes which during a specified interval use at least a predetermined amount of a given resource of the computing system; and

a workload data file into which said data collection and reduction means logs information about classes of processes.

5,067,108

SINGLE TRANSISTOR NON-VOLATILE ELECTRICALLY ALTERABLE SEMICONDUCTOR MEMORY DEVICE WITH A RE-CRYSTALLIZED FLOATING GATE

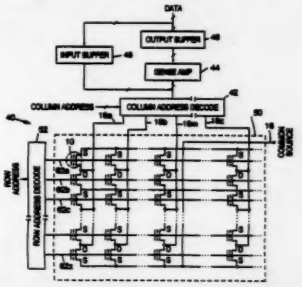
Ching-Shi Jenq, San Jose, Calif., assignor to Silicon Storage Technology, Inc., Sunnyvale, Calif.

Filed Jan. 22, 1990, Ser. No. 467,918

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] G11C *16/02*

U.S. Cl. 365—185 **3 Claims**



1. An electrically programmable and erasable memory device having a plurality of storage sites, a plurality of row lines, a plurality of column lines, and a common line, wherein each combination of one of the plurality of row lines and one of the plurality of column lines define a different one of the plurality of storage sites, and further wherein each of the plurality of storage sites comprises a single transistor, said single transistor comprising:

a source coupled to said common line;

a drain coupled to an associated one of the plurality of column lines;

a control gate coupled to an associated one of the plurality of row lines;

a recrystallized floating gate positioned between the control gate and the source and the drain and being capacitively coupled to the drain;

means for injecting hot electrons generated by an abrupt potential drop onto the recrystallized floating gate when selected ones of the column and row lines are raised to a first predetermined potential above that of the common line, with the potential applied to said selected one of the column lines being above the potential applied to said selected one of the row lines; and

means for inducing Fowler-Nordheim tunneling of charges from the floating gate to the control gate when the selected row line is raised to a second predetermined potential above the selected column line.

5,067,109

DATA OUTPUT BUFFER CIRCUIT FOR A SRAM

Byeong-Yun Kim, Seoul; Tae-Sung Jung, Buchun, and Yong-Bo Park, Busan, all of Rep. of Korea, assignors to Samsung Semiconductor and Telecommunications Co., Ltd., both of Gumi, Rep. of Korea

Filed Aug. 30, 1988, Ser. No. 238,247

Claims priority, application Rep. of Korea, Aug. 31, 1987, 87-9589[U]

Int. Cl.[5] G11C *8/00*

U.S. Cl. 365—189.05 **5 Claims**

1. For an SRAM having a sense amplifier which amplifies memory data and a read/write control circuit which controls operations of said sense amplifier, a data output buffer circuit comprising:

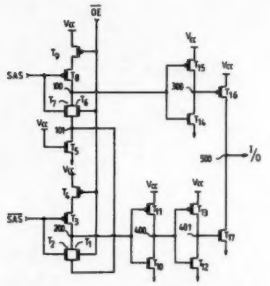
a drive output node from which said data output buffer circuit provides output data; and

means for generating a high impedance state on said drive

output node in response to a first signal (SAS) and a second signal ($\overline{SAS}$) provided by said sense amplifier, said second signal ($\overline{SAS}$) being an inversion of said first signal (SAS); said generating means comprising:

(a) first means for providing a NOR function of the SAS signal and an output enable signal (OE) from said read/-write control circuit;

(b) second means for providing a NOR function of the $\overline{SAS}$ signal and the output enable signal (OE) from said read/write control circuit;



(c) third means connected to said first and second means for eliminating noise produced by transition in the output of said first and second means and for enhancing a response time;

(d) fourth means for inverting the output signal of said first means;

(e) fifth means for inverting twice, sequentially, the output of said second means; and

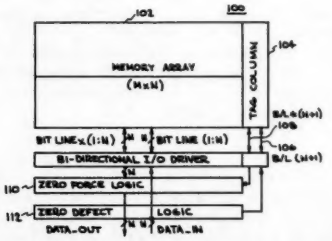
(f) sixth means responsive to said fourth and fifth means, for providing said high impedance state on said drive output node.

5,067,110

GLOBAL RESET AND ZERO DETECTION FOR A MEMORY SYSTEM

Thomas J. Runaldue, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 10, 1989, Ser. No. 418,680
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—189.07 **4 Claims**



1. A memory system having a global reset capability, comprising:

(MEMORY ARRAY) a memory array having an array of memory cells arranged in rows and columns;

(TAG COLUMN) tag bit storage means, having one tag-memory cell associated with each row of memory cells, each of said tag-memory cells having a zero state, which is indicative of all of the data information stored in the memory cells of an associated row actually being in the zero state or which is alternatively indicative of all of the data information being stored in the memory cells of an associated row being treated as being in the zero state, each of said tag-memory cells having a one state, which is indicative that at least one of the memory cells of an associated row contains data information in a non-zero state;

(INPUT DATA ZERO DETECT LOGIC) detection means for detecting that input data signals to a row of memory cells are all zeroes, said detection means including means for providing an output signal indicative of all zero input to said row of memory cells;

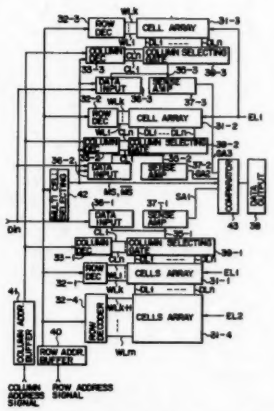
(RESET LINE) means for resetting a tag-memory cell to a zero state to indicate that the data information stored in the associated row is actually or is to be treated as containing all zeros, independent of the actual state of the data information being stored in the associated row of memory cells, thereby providing a global reset function for the entire array of memory cells without having to individually reset the data information stored in the array of memory cells.

5,067,111

SEMICONDUCTOR MEMORY DEVICE HAVING A MAJORITY LOGIC FOR DETERMINING DATA TO BE READ OUT

Masamichi Asano, Tokyo; Hiroshi Iwahashi, Yokohama, and Sadayuki Yokoyama, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1989, Ser. No. 426,803
Claims priority, application Japan, Oct. 28, 1988, 63-272046
Int. Cl.[5] G11C *7/00*; G06F *11/08*
U.S. Cl. 365—189.08 **18 Claims**



1. A semiconductor memory device comprising:

a first array of memory cells having a first area of M memory cells and a second area, in which data can be written electrically;

a first means for accessing a memory cell of the first array;

a plurality of second arrays of memory cells in which data can be written electrically, each second array having M memory cells, each memory cell of each second array corresponding to a respective memory cell of the first area;

means for determining when the first memory accessing means accesses a memory cell in the first area including means for determining when the first memory accessing means reads a memory cell from the first area;

means for determining when the first memory accessing means reads a memory cell from the second area;

second means, active when the first accessing means accesses a memory cell in the first area, for accessing a corresponding memory cell in each second array;

means for reading data to an external device including

first means, active when the first accessing means reads a memory cell in the first area, for reading data to an external device in accordance with a majority logic processing of a first read data from the first area and of a corresponding second read data from each second array; and

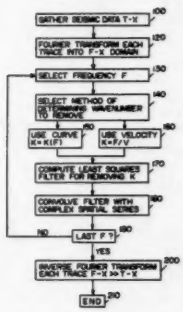
second means, active when the first accessing means reads a memory cell in the second area, for reading data to an external device in accordance with read data from the second area.

5,067,112

METHOD FOR REMOVING COHERENT NOISE FROM SEISMIC DATA THROUGH F-X FILTERING

Robert A. Meek, Sanger, and Andrew F. Linville, Jr., Dallas, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 4, 1991, Ser. No. 637,422
Int. Cl.[5] G01V *1/28, 1/36*
U.S. Cl. 367—43 **4 Claims**



1. In seismic exploration wherein seismic sources are activated at spaced locations along a line of exploration and the amplitude of reflections from subsurface formations are recorded as a function of time and distance along said line of exploration to produce a time-distance array of seismic traces, said traces comprised of a seismic signal component and a coherent noise component; a method of processing said seismic traces to remove said coherent noise component, comprising the steps of:

a) transforming said time-distance (t-x) array of seismic traces with a fast Fourier transform into a frequency-distance (f-x) domain D (f,x) in accordance with the following:

$$D(f,x) = \sum_{t=0}^{j-1} d(t,x)e^{-i2\pi ft/j}$$

where d(t,x) are the seismic traces in the t-x domain for x=1...n; n is the number of seismic traces; t=0,...,j; j is the number of time samples; D(f,x) are the seismic traces in the f-x domain; f=0 ... j.

b) determining a frequency within a range wherein said coherent noise component resides, said frequency range being dependent on the bandwidth of said coherent noise component,

c) determining a wavenumber corresponding to the coherent noise component of the determined frequency,

d) determining a least squares filter a(m) for removing said determined wavenumber from the frequency-distance domain seismic traces, D(f,x), in accordance with the following:

$$\begin{bmatrix} R(0)+\sigma^2 & R^*(1) & \dots & R^*(p-1) \\ R(1) & R(0)+\sigma^2 & \dots & R^*(p-2) \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ R(p-1) & R(p-1) & \dots & R(0)+\sigma^2 \end{bmatrix} \begin{bmatrix} a(0) \\ a(1) \\ \cdot \\ \cdot \\ \cdot \\ a(p-1) \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \\ \cdot \\ \cdot \\ \cdot \\ 0 \end{bmatrix}$$

where * means complex conjugate, $R(m)=e^{i2\pi km\Delta x}$ for m=0...p-1; σ^2 is a random noise term added to the diagonals; σ^2 governs how deep the wavenumber notch will be (for small σ^2 the notch will be deep and for a larger σ^2 the notch will be shallow); and the width of the notch is controlled by the number (p) of coefficients generated,

e) convolving said least squares filter a(m) with D(f,x), the (f,x) domain seismic traces to remove the determined wavenumber in accordance with the following:

$$D'(f,x) = \sum_{m=0}^{p-1} a(m)D(f,x-m) \quad \text{for } x = 1 \dots n$$

where D'(f,x) is the filtered data and n is the number of traces, and

f) transforming said filtered (f,x) domain seismic traces, D(f,x), with a fast Fourier transform back to the time-distance (t-x) domain to produce a time-distance (t-x) array of seismic traces with said coherent noise component removed in accordance with the following:

$$d'(t,x) = \frac{1}{j}\sum_{t=0}^{j-1} D(f,x)e^{i2\pi ft/j}$$

where d'(t,x) represents the data after coherent noise removal.

5,067,113

EFFICIENT GENERATION OF TRAVELTIME TABLES FOR TWO DIMENSIONAL AND THREE DIMENSIONAL PRESTACK DEPTH MIGRATION

Douglas W. Hanson; Shein S. Wang, and William S. Harlan, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 30, 1990, Ser. No. 606,378
Int. Cl.[5] G01V *1/28, 1/30*
U.S. Cl. 367—50 **9 Claims**

9. A method for generating traveltimes through multiple layers for traveltime tables for application in depth migration comprising the steps of:

receiving a velocity model including a plurality of velocities in multiple layers between various subsurface reflectors;

plotting the model on a two dimensional grid with the subsurface reflectors identified;

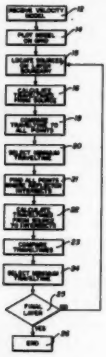
determining a traveltime to each grid point and each point on a first reflector that intersects a vertical grid line;

identifying all points where the first reflector intersects the grid;

generating the traveltimes to a second reflector using the intersection points on the first reflector as secondary sources and determining traveltimes from said reflection

points on the first reflector to a second reflector by comparing the traveltimes to all points on the second reflector that intersect a vertical grid line from each secondary source and selecting the minimum traveltime from said secondary sources to each intersection point as the true traveltime from the first reflector;

identifying all points where the second reflector intersects the grid; and



generating the traveltimes to a third reflector using the intersection points on the second reflector as secondary sources and determining traveltimes from said reflection points on the second reflector to a third reflector by comparing the traveltimes to all points on the third reflector that intersect a vertical grid line from each secondary source on said second reflector and selecting the minimum traveltime from said secondary sources on said second reflector to each intersection point as the true traveltime from the second reflector.

5,067,114

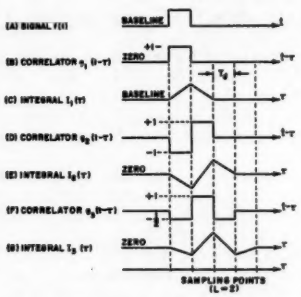
CORRELATION FOR COMBINATIONAL CODED TELEMETRY

Louis H. Rorden, Los Altos, Calif., assignor to Develco, Inc., San Jose, Calif.

Continuation of Ser. No. 334,268, Apr. 6, 1989, abandoned, which is a continuation of Ser. No. 212,670, Jun. 28, 1988, Pat. No. 4,908,804, which is a division of Ser. No. 907,727, Sep. 15, 1986, Pat. No. 4,787,093, which is a continuation of Ser. No. 477,003, Mar. 21, 1983, abandoned. This application Mar. 26, 1990, Ser. No. 500,107

Int. Cl.[5] H04N *9/00*

U.S. Cl. 367—81 **8 Claims**



7. The method of communicating a datum, W, across a communication channel from a data source to a data receiver, by a sequence of time displaced, nonadjacent, constant width pulses within a fixed time interval T_W, said time interval having beginning and final ends and being independent of said datum W, comprising the steps,

(a) ordering a combinatorial set of said sequence of pulses,

(b) determining from said datum, a particular one of said sequence of time displaced pulses of said combinatorial set,

(c) generating and transmitting said determined sequence of time displaced pulses across said communication channel,

(d) recovering said transmitted sequence of time displaced pulses from said communication channel,

(e) performing the inverse of the determination of step (b) on the recovered sequence of pulses to obtain a representation of said datum W, and

(f) said step of recovering including correlating a baseline signal having said determined sequence of time displayed pulses with a correlator signal having a zero moment and a plurality of convolutions, each of which has adjacent positive and negative values relative to a zero level.

5,067,115

ULTRASONIC OBSTACLE SENSOR

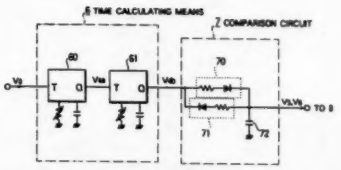
Shunichi Wada, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 5, 1990, Ser. No. 608,787

Claims priority, application Japan, Nov. 6, 1989, 1-287347

Int. Cl.[5] G01S *15/00*

U.S. Cl. 367—99 **6 Claims**



1. An ultrasonic obstacle sensor comprising:

timing instruction means for generating an instruction signal for intermittently providing ultrasonic waves;

an ultrasonic wave generator for generating ultrasonic waves based on the instruction signal from said timing instruction means;

an ultrasonic transmitter for transmitting the ultrasonic waves toward a road surface;

an ultrasonic receiver for receiving the ultrasonic waves reflected from the road surface to generate a reception signal;

reception signal processing means for AM demodulating the reception signal to provide an AM demodulation signal;

time calculation means for calculating a time elapsing from the time of generation of the instruction signal;

a discrimination signal generator for generating a discrimination signal having an intensity which increases before a lapse of a predetermined time from the time of generation of the instruction signal, and decreases thereafter; and

a comparison circuit for making a comparison between the AM demodulation signal and the discrimination signal to generate an output signal representative of the presence or absence of an obstacle on the road surface.

5,067,116

AUTOMATIC DISC CHANGER APPARATUS

Kenneth A. Kadrmas, 9114 Hogan Dr., Huntsville, Ala. 35802

Filed May 7, 1990, Ser. No. 519,753

Int. Cl.[5] G11B *17/22, 15/10*

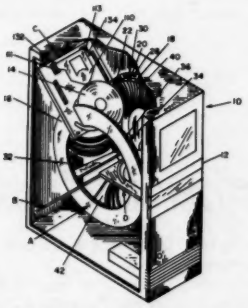
U.S. Cl. 369—37 **27 Claims**

1. An automatic optical disc data storage and retrieval system comprising:

an annular disc storage carrousel member having adjacent disc storage compartments, said storage carrousel member

disposed for receiving and storing optical discs therein regardless of physical orientation of said storage carrousel member, said carousal having an upper annular plate and a lower circular plate, said plates disposed in spaced relation and having spaced aligned grooves thereon to define radially arranged compartments to receive an optical disc therein;

an optical disc insert and ejector means for inserting and ejecting said optical discs into and out of said annular disc storage member;



at least one optical disc player disposed for receiving and playing an optical disc;

optical disc displacement means associated with said optical disc player for moving said optical disc radially into and out of a predetermined compartment of said annular disc storage member in a linear path;

an enclosure for enclosing said annular disc storage member, said optical disc insert and ejector means, and said optical disc displacement means;

and means for rotating said carrousel.

5,067,117

OUTPUT STABILIZING APPARATUS FOR AN OPTICAL HEAD

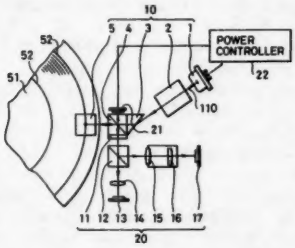
Hideo Shimizu, and Yasuhiro Takahashi, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 25, 1989, Ser. No. 426,278

Claims priority, application Japan, Oct. 28, 1988, 63-272318

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **8 Claims**



1. An output stabilizing apparatus for an optical head, comprising:

a semiconductor laser;

a beam splitter having a half mirror surface for dividing a laser beam emitted from said semiconductor laser into a first beam transmitted through said half mirror surface and a second beam reflected from said half mirror surface;

an optical projection system for projecting said laser beam emitted from said semiconductor laser onto said beam splitter and for projecting said first beam transmitted through said beam splitter onto a data storage medium;

photodetector means for receiving said second beam split by said beam splitter and for converting said second beam received thereby into an electrical signal; and

control means for controlling the intensity of said laser beam emitted from said semiconductor laser in response to said photodetector means.

5,067,118

POSITION DETECTING DEVICE FOR USE BY SWITCHING PLURAL ALTERNATING SIGNALS HAVING DIFFERENT PHASES FROM EACH OTHER

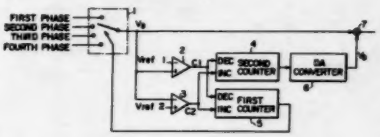
Shigeto Kanda, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1989, Ser. No. 334,195

Claims priority, application Japan, Apr. 7, 1988, 63-084024

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.27 **26 Claims**



1. A position detecting device comprising:

alternating signal generating means for generating a plurality of alternating, phase-shifted signals which alternate in accordance with changes in position or angle of a movable member;

selecting means for selecting one of the plurality of alternating signals;

signal supplying means for selectively supplying signals having output levels different from each other;

adding means for adding one of the alternating signals selected by said selecting means and one of the signals supplied from said signal supplying means, and for outputting a sum signal as a position detection signal; and

phase detecting means for detecting the selected alternating signal and for outputting signals to said selecting means and said signal supplying means when a phase of the selected alternating signal reaches a predetermined phase, and said selecting means comprising means for switching the selected alternating signal and said signal supplying means comprising means for supplying another one of the signals having a different output level to said adding means, in response to a signal from said phase detecting means.

5,067,119

RECORDING MEDIUM PLAYING APPARATUS WITH AUTOMATIC TONAL RESPONSE SETTING FUNCTION

Masayuki Yoshida; Junichi Yoshio, and Osamu Watanabe, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Division of Ser. No. 442,769, Nov. 29, 1989. This application Apr. 22, 1991, Ser. No. 688,798

Claims priority, application Japan, Jun. 1, 1989, 1-139434

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—47 **4 Claims**

1. An apparatus for playing recording media carrying audio signals, comprising:

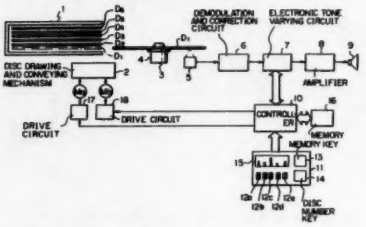
a storing part for simultaneously storing a plurality of recording medium of a similar shape, wherein each recording medium is stored in separate positions within the storing part;

a tone response control means for controlling the tone of sounds reproduced from said audio signals, by controlling signal levels of frequency components in a plurality of frequency bands, which are set to divide the frequency range of said audio signals, to designated variation ratios;

a memory means;

a command means for generating a reproducing-tone memorizing command and said variation ratios of said signal levels;

a memory control means for storing, in response to said reproducing-tone memorizing command, data representing said variation ratios in said memory means corresponding to identification information of each of said recording media, said data representing said variation ratios being stored as tone data sets, wherein each of said data sets is associated with a unique identification code and each of said identification codes is associated with one of said separate storing positions; and



a tone response setting means for reading out said tone data sets dependent upon which identification code is selected, said selected identification code corresponding to a selected storing position of a selected recording medium to be played, and subsequently supplying said variation ratios represented by said read out tone data set to said tone response control means, thereby setting the tone of the reproduced sound, wherein said tone response setting means automatically changes the readout tone data to correspond with an automatic change of the selected storing position.

5,067,120

DISK DRIVE APPARATUS

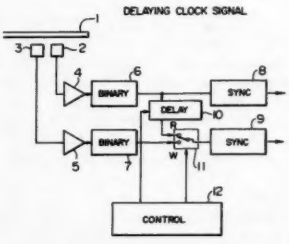
Satoru Yamauchi, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Apr. 7, 1989, Ser. No. 334,562

Claims priority, application Japan, Apr. 7, 1988, 63-84142; Jun. 7, 1988, 63-138541

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—59 **6 Claims**



1. A disk drive apparatus for deriving a 0-order light and a 1-order light from an output laser beam of a single laser source by a diffraction grating, reading a prepit train on a disk by the 0-order light and the 1-order light to reproduce synchronization signals, generating a first clock by a first synchronization circuit based on the synchronization signal reproduced by the 0-order light, and generating a second clock by a second synchronization circuit by the synchronization signal reproduced by the 1-order light, comprising:

first and second detecting means for supplying first and second read signals;

delay means for delaying the synchronization signal reproduced by the 0-order light; and

selection means for selecting the synchronization signal reproduced by the 1-order light in a write mode and the synchronization signal produced by said delay means in a read mode and supplying the selected synchronization signal to said second synchronization circuit;

said first clock being used as a data write clock in the write mode and as a data read clock in the read mode,

said second clock being used as the data read clock in the write mode.

5,067,121

DISC-RECORD PLAYER COMPRISING A DISC-LOADING DEVICE FOR A DISC SUPPORTED ON A TRAY

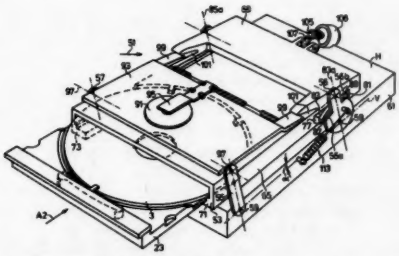
Hermanus F. Einhaus, Ham, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 27, 1988, Ser. No. 263,660

Claims priority, application Netherlands, Nov. 2, 1987, 8702604

Int. Cl.[5] G11B *17/04*

U.S. Cl. 369—75.2 **18 Claims**



1. A disc-record player comprising:

a frame and a turntable mounted to be rotatable about an axis of rotation with respect to said frame, said turntable comprising a supporting surface for a disc placed on the turntable,

a device for recording and/or reading information on/from a disc placed on said turntable, and

a disc-loading device comprising a holder which is adapted for receiving, while the holder is in an initial position, a tray having a supporting surface for a disc placed thereon; and means for moving said holder, and for transferring said tray and disc to said turntable and separating said disc from said tray, during movement in a loading direction from said initial position, and for returning said disc by an unloading movement to the initial position,

characterized in that said disc-loading device comprises two pivotal elements which are pivotally connected to the frame, and are movably connected to the holder at respective sides of the holder transverse to the loading direction,

said pivotal elements being pivoted in a first direction during said movement in a loading direction to move the supporting surface of the tray at least in a direction parallel to the axis of rotation of the turntable to a position beyond the supporting surface of the turntable, thereby placing the disc on the turntable supporting surface; and being pivoted in an opposite second direction during said unloading movement to life the disc off the turntable.

5,067,122

METHOD OF DETERMINING THE MONITOR SENSITIVITY OF, AND METHOD AND SYSTEM FOR CONTROLLING A RADIATION EMITTING ARRANGEMENT, AND OPTICAL RECORDING AND/OR REPRODUCING APPARATUS INCLUDING SUCH A SYSTEM

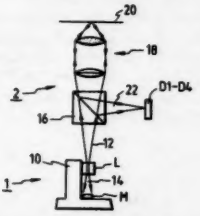
Philip J. L. McGee, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1990, Ser. No. 482,375

Claims priority, application United Kingdom, Feb. 27, 1989, 8904406

Int. Cl.[5] G11B 7/00, 7/85

U.S. Cl. 369—116 17 Claims



1. A method of determining the monitoring sensitivity of a radiation source which is monitored by a radiation detector, the radiation detector producing a monitor signal which is related to the optical output of the radiation source, the monitoring sensitivity being the rate of change of the monitor signal level relative to the optical output level of the radiation source; said method comprising the steps of:

(i) supplying a varying drive signal to the radiation source and measuring the rate of change of the monitor signal relative to the supplied drive signal; and

(ii) determining the monitoring sensitivity by combining the measured rate of change of the monitor signal with a predetermined differential efficiency which is indicative of the rate of change of the optical output of the radiation source relative to the drive signal supplied thereto.

5,067,123

SYSTEM FOR CONTROLLING DATA TRANSMISSION IN ATM SWITCHING NETWORK

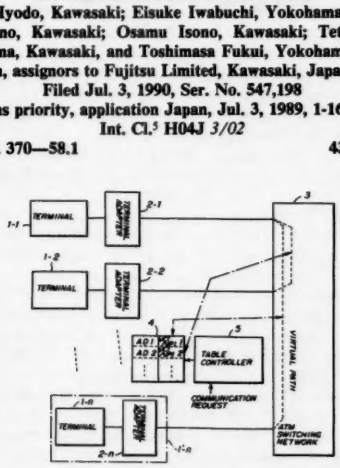
Ryuji Hyodo, Kawasaki; Eisuke Iwabuchi, Yokohama; Tetsuo Nishino, Kawasaki; Osamu Isono, Kawasaki; Tetsuo Tachibana, Kawasaki, and Toshimasa Fukui, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 3, 1990, Ser. No. 547,198

Claims priority, application Japan, Jul. 3, 1989, 1-169772

Int. Cl.[5] H04J 3/02

U.S. Cl. 370—58.1 43 Claims



1. A transmission control system comprising:

an asynchronous transfer mode (ATM) switching network providing virtual channels;

a plurality of terminals;

a plurality of terminal adapters connected to said ATM switching network and respectively connected to said plurality of terminals, each of said terminal adapters coupling a corresponding one of said terminals to said ATM switching network, data being transferred between any pair of said terminals through two corresponding terminal adapters from among said terminal adapters and said ATM switching network;

management table means, including a management table, for registering the virtual channels presently formed in said ATM switching network in said management table, each of said virtual channels mutually connecting two corresponding terminal adapters through said ATM switching network;

retrieval means for receiving a communication request from a first one of said terminals and for determining whether said management table registers a virtual channel corresponding to the communication request, data output from the first one of said terminals being transferred to a second one of said terminals addressed by the communication request through the virtual channel corresponding to the communication request and the two corresponding terminal adapters corresponding to the first and second ones of said terminals when said retrieval means determines that said management table has the virtual channel corresponding to the communication request;

virtual channel setting means for registering the virtual channel corresponding to the communication request in said management table when said retrieval means determines that said management table does not have the virtual channel corresponding to the communication request, data output from the first one of said terminals being transferred to the second one of said terminals addressed by the communication request through the virtual channel registered in said management table by said virtual channel setting means; and

virtual channel releasing means for deleting any of said virtual channels from said management table of said management table means satisfying a predetermined condition of virtual channel use within said ATM switching network to release said virtual channels unlikely to be reused.

5,067,124

PACKET SWITCHING NETWORK FOR A COMMUNICATION SYSTEM

Ulrich Killat, Hamburg, and Johann Kruger, Quickborn, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1989, Ser. No. 414,036

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1988, 3833490

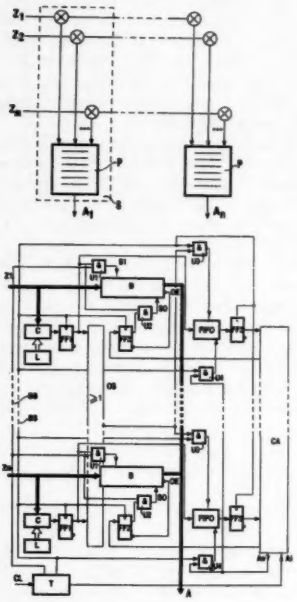
Int. Cl.[5] H04Q 11/04; H04J 3/24

U.S. Cl. 370—60 12 Claims

1. Switching network for a communication system, comprising m/1 stages which include auxiliary lines (Z1 . . . Zm) and have each a trunk line (A) and in which cells are switched through on the basis of routing information contained in a header of each cell and in which a cell arriving at an auxiliary line is written into a buffer (B) dedicated to a trunk line (A) if the routing information and address of this trunk line match and in which a decision circuit (CA) is included in each m/1 stage, characterized in that, in each m/1 stage,

each auxiliary line (Z1 . . . Zm) is assigned a memory (FIFO) to which are applied the results of the comparisons of the routing information and address of the trunk line (A) and

the contents of the memory (FIFO) are applied to the decision circuit (CA) which, on the basis of these contents,



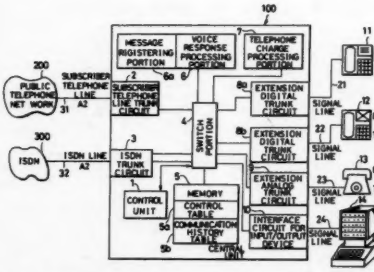
determines the order in which the cells stored in the buffers (B) are read out.

5,067,125

TELEPHONE SYSTEM FOR ISDN AND PUBLIC TELEPHONE NETWORKS

Shinji Tsuchida, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 22, 1989, Ser. No. 396,651
Claims priority, application Japan, Aug. 25, 1988, 63-209455
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—79 **16 Claims**



1. A telephone system connected to at least an ISDN and a public telephone network capable of accommodating an extension line connected to an analog signal I/O terminal and an extension line connected to a digital signal I/O terminal, said telephone system comprising:

D/A conversion means capable of converting digital communication information into a corresponding analog communication information;

A/D conversion means capable of converting analog communication information into a corresponding digital communication information; and

communication line control means capable of controlling a communication line arranged between a line connected to said ISDN, a line connected to said public telephone network, and said accommodated extension lines,

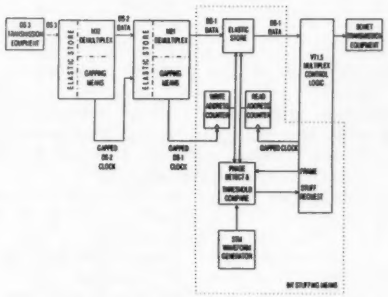
wherein a call made from said ISDN and said public telephone network can be responded to by both said analog signal I/O terminal and said digital signal I/O terminal which are connected to said extension lines, through use of said D/A conversion means and A/D conversion means.

5,067,126

METHOD AND APPARATUS FOR MAPPING A DIGITAL SIGNAL CARRIER TO ANOTHER

Thomas E. Moore, Edmonton, Canada, assignor to Telecommunications Research Laboratories, Edmonton, Canada

Filed Aug. 4, 1989, Ser. No. 389,768
Claims priority, application Canada, May 30, 1989, 601201
Int. Cl.[5] H04J *3/04, 3/22*
U.S. Cl. 370—112 **4 Claims**



1. A process for the mapping of a first digital signal carrier carrying a first multiplexed digital signal to a second digital signal carrier comprising:

demultiplexing the first digital signal to produce a second digital signal and to derive a gapped clock;

writing the second digital signal to an elastic store using the gapped clock; and

reading the second digital signal from the elastic store.

5,067,127

CONGESTION AVOIDANCE CONTROL SYSTEM AND METHOD FOR COMMUNICATION NETWORK

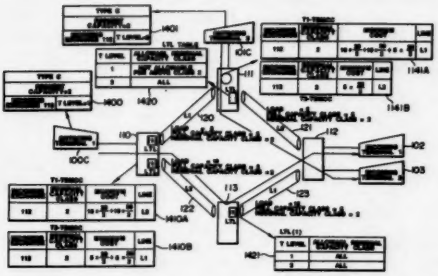
Tamiya Ochiai, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1990, Ser. No. 584,660
Claims priority, application Japan, Sep. 21, 1989, 1-246104
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—58.1 **13 Claims**

1. A congestion avoidance control system for a communication network having a plurality of exchanges interconnected by a plurality of lines for deciding one of communication routes leading from outgoing one of said plurality of exchanges including an outgoing terminal to incoming one thereof including an incoming terminal, each of said exchanges comprising:

every-line residual-capacity minimum-cost memory means for storing one of a plurality of line residual capacity classes of line capacity units corresponding to a full line capacity of its own exchange minus a line capacity being now used thereof as a residual line capacity, minimum cost one of lines forming the routes leading from its own exchange to the incoming exchange, and a minimum cost value;

retrieval means, when a calling request having a request use capacity as an application data is issued from said outgoing terminal, for retrieving said minimum cost line of one of the line residual capacity classes satisfying said request use capacity from said every-line residual-capacity minimum-cost memory means;



decision means for deciding one of the communication routes on the basis of the minimum cost line retrieved by said retrieval means; and

correction means for correcting the minimum cost value of said every-line residual-capacity minimum-cost memory means with use of a reciprocal of a ratio of the own residual line capacity to an intra-network line full capacity multiplied by a line fixed load value.

5,067,128

RECORDED DATA READING SYSTEM

Hiroshi Nakane, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 22, 1989, Ser. No. 411,389
Claims priority, application Japan, Sep. 30, 1988, 63-243829
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—5.5 **24 Claims**

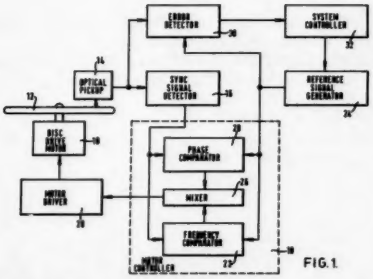


FIG. 1

1. An apparatus for reading data stored on a data storage medium, comprising:

data readout means for reproducing data stored on the data storage medium;

error detection means, coupled to the data readout means, for detecting an error rate at which errors occur in the data reproduced by the data readout means;

readout control means for operating the data readout means at a selected data readout rate; and

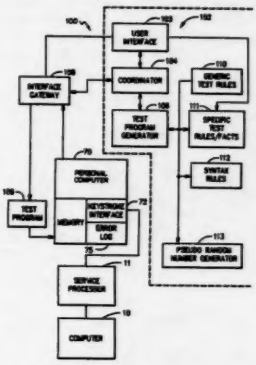
system control means, coupled to the error detection means and the readout control means, for comparing the error rate to a predetermined system maximum error rate and for increasing the selected data readout rate when the error rate is below the predetermined system maximum error rate.

5,067,129

SERVICE PROCESSOR TESTER

Timothy G. Evans, Endicott; Mark W. Gould, Johnson City, and Timothy J. McNamara, Endicott, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 16, 1989, Ser. No. 394,696
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—16.1 **17 Claims**



1. Apparatus for testing a service processor associated with and coupled to a computer, said computer including a hierarchical arrangement of actual screens in storage for display by said service processor, said apparatus comprising:

storage means for storing a map indicating a correct hierarchical order of screens; and

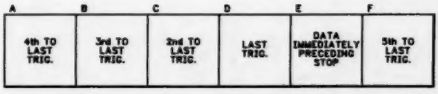
program generating means, coupled to said storage means, for generating a program to (a) direct said service processor to display said actual screens in a hierarchical order reflecting said hierarchical arrangement of actual screens in said storage of said computer and (b) compare the map provided by said storage means to the hierarchical order of actual screens displayed by said service processor to determine if said service processor displays the correct hierarchical order of actual screens.

5,067,130

METHOD FOR ACQUIRING DATA IN A LOGIC ANALYZER

Ronald M. Jackson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 29, 1989, Ser. No. 414,337
Int. Cl.[5] G06F *11/00*
U.S. Cl. 371—22.1 **16 Claims**



1. A method for acquiring data in a logic analyzer having a plurality of memory sections, the method comprising the steps of:

automatically storing data in one of the plurality of memory sections upon in occurrence of a trigger condition;

repeating the automatically storing step upon the further occurrence of the trigger condition until all of the memory sections have been used;

continuing to repeat the automatically storing step after all of the memory sections have been used once by reusing the memory sections to store new data;

automatically ascertaining that the trigger condition is no longer occurring; and

automatically stopping the logic analyzer to complete the data acquisition in response to the ascertaining step.

5,067,131

APPARATUS AND METHOD FOR RECORDING AND/OR REPRODUCING A DIGITAL SIGNAL

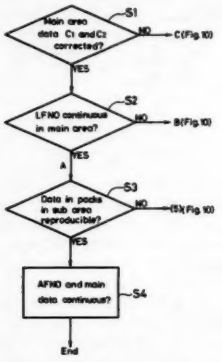
Kentaro Odaka, Tokyo; Shinya Ozaki, Kanagawa; Yoshizumi Inazawa, Kanagawa; Masaki Yamada, Kanagawa; Hiroshi Ishibashi, Kanagawa, and Tatsuya Iijima, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 262,487, Oct. 25, 1988. This application May 25, 1990, Ser. No. 529,884

Claims priority, application Japan, Oct. 27, 1987, 62-270531; Dec. 14, 1987, 62-315789

Int. Cl.[5] H03M *13/00*

U.S. Cl. 371—40.1 **14 Claims**



1. An apparatus for reproducing a digital signal containing main data, sub-data, and check data recorded in tracks formed on a recording medium, with each track having a main area in which is recorded the main data and a sub-area in which is recorded the sub-data and the check data for detecting an error in data recorded in said main area, the reproducing apparatus comprising:

means for reproducing the main data, the sub-data, and the check data recorded in the tracks formed on the recording medium, thereby generating reproducing main data, reproduced sub-data, and reproduced check data;

means for extracting said reproduced check data from the reproduced main data and the reproduced sub-data; and

means for comparing the reproduced check data with the reproduced main data, and determining whether an error exists in the main data.

5,067,132

ONE OUT OF N CHECKING APPARATUS AND METHOD

John A. Blakkan, Santa Clara, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed May 18, 1989, Ser. No. 353,717

Int. Cl.[5] H03M *13/02*

U.S. Cl. 371—52 **13 Claims**

2. An apparatus for checking N signal lines to determine whether exactly one of the N signal lines is active, comprising:

a plurality of leaf nodes, each leaf node including:

two leaf inputs, at least one of which is coupled to one of the N signal lines and any unused leaf input signal line is set to be inactive; and

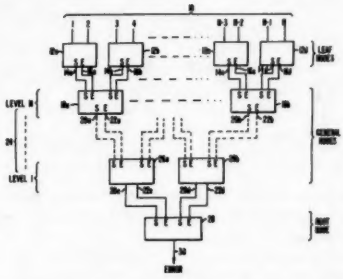
a seen-error (S-E) pair leaf output wherein the seen component is active when at least one of the leaf inputs is active and the error component is active when both inputs are active;

a plurality of general nodes configured in a hierarchy of M levels such that M is a whole number, each general node including:

two S-E pair general inputs for receiving at least one S-E pair from one of either (i) an S-E pair leaf output or (ii) an SE pair general output; and

a single S-E pair general output including:

a seen component which is active if at least one of the S inputs is active; and



an error component which is active if (i) one or more of the E inputs is active or (ii) both S inputs are active; and

a root node including:

two S-E pair root inputs for receiving two S-E pair general outputs from the M level of the general nodes; and

a root error output for outputting an error signal when (i) the seen components of both of the M level general node outputs are active, (ii) the seen components of both of the M level general node outputs are inactive, or (iii) at least one of the error components of the M level general note outputs is active.

5,067,133

ERROR-CORRECTION OF STORED TELEVISION SIGNALS

Robert Billing, Crowthorne, Great Britain, assignor to Questech Limited, Wokingham, United Kingdom

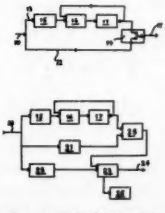
PCT No. PCT/GB87/00922, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989, PCT Pub. No. WO88/05245, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 30, 1987, Ser. No. 377,832

Claims priority, application United Kingdom, Dec. 30, 1986, 8631027; Jun. 3, 1987, 8713018

Int. Cl.[5] G06F *11/10;* **H04N** *5/907*

U.S. Cl. 371—53 **8 Claims**



1. A method of storing a digital television picture image in a solid state store comprising the steps of generating a code from the data contained in each line of the video raster and storing a code value corresponding to said code in association with the data relating to each line of the picture signal, the code value being derived from the stored data in such a manner that an error occurring in any bit of the data relating to a given line, following storage thereof, can be detected by re-computing a

code value from data retrieved from the store in relation to said line and comparing the re-computed code value with that originally stored in relation to the same line, wherein said code value is derived by summing, for each byte of data in each line of the picture signal, the value of each bit multiplied by the position of that bit in the line.

5,067,134

DEVICE FOR GENERATING BLUE LASER LIGHT

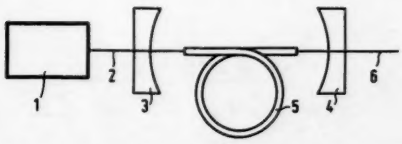
Emmanuel W. J. L. Oomen, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Mar. 8, 1991, Ser. No. 667,610

Claims priority, application Netherlands, Mar. 8, 1990, 9000532

Int. Cl.[5] H01S *3/17*

U.S. Cl. 372—6 **7 Claims**



1. A device for generating blue laser light having a wavelength of 445 to 455 nm by means of an upconversion process, said device including a pumping laser and a resonator cavity comprising a fluoride-containing material having trivalent thulium ions, characterized in that the fluoride-containing material is a glass composition of heavy-metal fluorides and in that a single semiconductor laser is used as the pumping laser which emits light having a wavelength of 640 to 700 nm.

5,067,135

GAS LASER APPARATUS

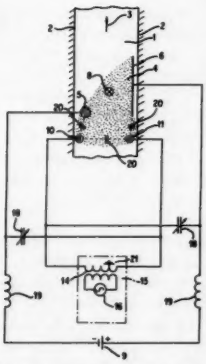
Peter R. Perzl, Fürstenfeldbruck; Wolfgang Rüberg, Aschheim, and Heinz B. Puell, Munich, all of Fed. Rep. of Germany, assignors to Haraeus Holding GmbH, Hanau am Main, Fed. Rep. of Germany

Filed May 4, 1990, Ser. No. 519,130

Claims priority, application Fed. Rep. of Germany, May 6, 1989, 3914923

Int. Cl.[5] H01S *3/0971*

U.S. Cl. 372—83 **7 Claims**



1. Apparatus for the input of electrical energy into an active gas in a laser, said apparatus comprising

a gas discharge chamber through which said gas flows at high velocity, said chamber comprising an input end and an exit end defining a direction of flow of said gas,

an anode and an elongated cathode lying opposite each other in said discharge chamber and having like lengths extending transversely of the direction of flow,

a DC power supply connected to said anode and said cathode for applying a voltage therebetween to maintain a steady glow discharge of said active gas flowing therebetween,

two elongated pre-ionizing electrodes lying opposite each other in said discharge chamber, each electrode being enveloped in dielectric material and having a like length as said anode and said cathode, one of said electrodes being placed ahead of the anode in the direction of flow, the other electrode being placed ahead of the cathode in the direction of flow, and

an AC power supply connected to said pre-ionizing electrodes and including means for operating said electrodes out of phase with each other so that a potential difference is produced between said electrodes and an auxiliary discharge burns ahead of said cathode and said anode in the direction flow.

5,067,136

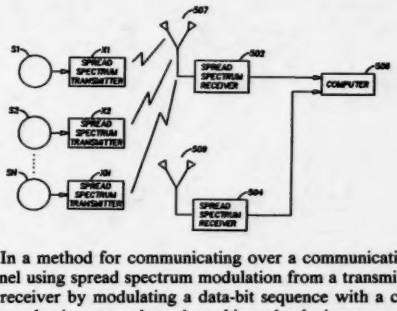
WIRELESS ALARM SYSTEM

James D. Arthur, Costa Mesa, Calif.; H. Britton Sanderford, Jr., New Orleans, La.; Robert E. Rouquette, Kenner, La., and Robert J. Davis, New Orleans, La., assignors to Axonn Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 266,461, Nov. 2, 1988, Pat. No. 4,977,577. This application Jul. 12, 1990, Ser. No. 551,815

Int. Cl.[5] H04B *15/00*

U.S. Cl. 375—1 **14 Claims**



1. In a method for communicating over a communications channel using spread spectrum modulation from a transmitter to a receiver by modulating a data-bit sequence with a chip sequence having a pseudorandom chip code, the improvement characterized by:

generating a preamble for receiver chip code synchronization having one of the group of alternating 1-bits and 0-bits, wherein the data-bit sequence ranges from a one to one ratio to a ten to one ratio.

5,067,137

ADJACENT CHANNEL INTERFERENCE CANCELLER WITH MEANS FOR MINIMIZING INTERSYMBOL INTERFERENCE

Ichiro Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 501,901

Claims priority, application Japan, Mar. 31, 1989, 1-82810

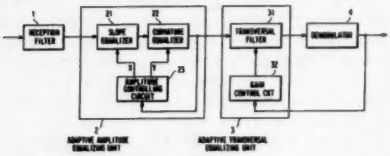
Int. Cl.[5] H04B *3/06*

U.S. Cl. 375—14 **2 Claims**

1. A device for use in processing a device input signal carrying a digital symbol sequence to produce a device output signal, said device comprising a reception filter for filtering said device input signal to produce a filter output signal having an amplitude distortion resulting in a predetermined frequency

band from adjacent interference on said predetermined frequency band by other frequency bands adjacent to said predetermined frequency band, said amplitude distortion including a linear slope distortion and a high order curvature distortion, the device comprising:

adaptive amplitude equalizing means including a slope equalizer and a curvature equalizer, said slope equalizer being responsive to said filter output signal for equalizing



said linear slope distortion to produce a slope equalized signal, said curvature equalizer being responsive to said slope equalized signal for equalizing said high order curvature distortion to produce a first equalized signal having intersymbol interference; and

adaptive transversal equalizing means responsive to said first equalized signal for equalizing said intersymbol interference to produce a second equalized signal as said device output signal.

5,067,138

PHASE-LOCKED-LOOP CIRCUIT AND BIT-DETECTION ARRANGEMENT COMPRISING SUCH A PHASE-LOCKED-LOOP CIRCUIT

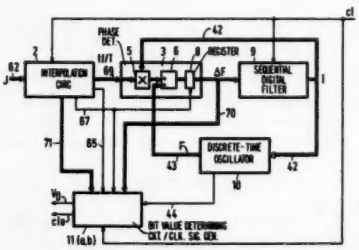
Antonia C. Van Rens; Eise C. Dijkmans, and Eduard F. Stikvoort, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 285,131, Dec. 15, 1988, Pat. No. 4,912,729. This application Apr. 27, 1989, Ser. No. 344,184

Claims priority, application Netherlands, May 16, 1988, 8801254

Int. Cl.[5] H03D *3/02*

U.S. Cl. 375—81 **11 Claims**



11. A phase-locked loop circuit for deriving, from an input sequence of samples of a band-limited data signal, the phase of the data signal at corresponding sampling instants, said phase-locked loop circuit comprising signal generating means for generating, in synchronism with the samples, a sequence of phase values characterizing a periodic signal having an amplitude which varies as a substantially linear function of time between a first and a second limit value, said first and said second limit values being constant, and a frequency which is proportional to a control value, means for deriving an interpolation value representing an instant, defined by the samples, at which the data signal crosses a detection level, phase comparison means for deriving from the phase values and the samples, a difference value which is indicative of the difference between the phase value and the interpolation value, and control means for controlling the signal generating means depending on the difference value is in such a way that the phase indicated by the phase value is maintained substantially equal to the phase of the data signal, characterized in that said phase comparison means comprises means for deriving as the difference value a value which substantially indicates a linear combination of the phase value and a product of the interpolation value and the control value, the control means varying the control value depending on the difference value thus determined.

5,067,139

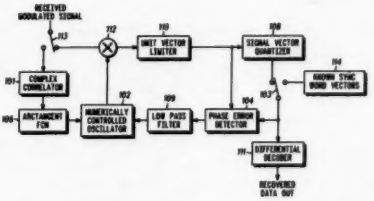
COHERENT DETECTOR FOR QPSK MODULATION IN A TDMA SYSTEM

James C. Baker, Hanover Park; Henry L. Kazecki, Arlington Heights, and Steven H. Goode, Barrington, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 17, 1990, Ser. No. 628,747

Int. Cl.[5] H04L *27/22*

U.S. Cl. 375—86 **10 Claims**



1. A coherent detector apparatus having a vector input that has been data modulated and a recovered data output, the data comprising synchronization words and data words, the apparatus comprising:

a) multiplying means having an output and a first and a second input;

b) correlation means for generating a synchronization word correlation vector from the vector input;

c) arctangent function means for generating an angle for the synchronization word correlation vector;

d) first switching means for coupling the vector input to the correlation means in a first position and the vector input to the first input of the multiplying means in a second position;

e) vector limiting means, coupled to the output of the multiplying means, for limiting the vector input to unity;

f) signal vector quantizing means, coupled to the output of the vector limiting means, for generating a quantized received signal vector;

g) phase error detection means, coupled to the vector limiting means, for generating a phase error signal;

h) synchronization word storage means for storing the synchronization words;

i) controllable oscillator means, having a first input coupled to the arctangent function means, a second input coupled to the phase error detection means, for receiving the phase error signal, and an output coupled to the second input of the multiplying means, the controllable oscillator means generating a variable frequency signal in response to the phase error signal when the first switching means is in the second position and in response to the angle when the first switching means is in the first position;

j) second switching means for coupling the synchronization word storage means to the phase error detection means in a first position and the phase error detection means to the signal vector quantizing means in a second position; and

k) decoding means, having an input coupled to the signal quantizing means and an output coupled to the recovered data output, for decoding the phase data signal into data bits.

5,067,140

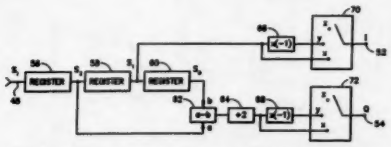
CONVERSION OF ANALOG SIGNAL INTO I AND Q DIGITAL SIGNALS WITH ENHANCED IMAGE REJECTION

Fritz K. Weinert, San Diego, Calif., assignor to Titan Linkabit Corporation, San Diego, Calif.

Filed Aug. 16, 1989, Ser. No. 395,011

Int. Cl.[5] H04L *27/38*

U.S. Cl. 375—77 **3 Claims**



1. A system for converting an analog signal into (I) in-phase and a (Q) quadrature-phase digital signals, comprising

means for converting an analog input signal A·sin $((\omega_o+\omega_s)t+\phi))$ at a sampling rate of $f=1/\tau=4\ f_o/(4\ m+2\ a-1)$, wherein m is 0, 1, 2, . . . ; and a is either 0 or 1, to provide a sequence of digital signal samples:

$$S_0=A\cdot\sin\ \phi,$$

$$S_1=A\cdot\cos\ (\omega_s\tau+\phi),$$

$$S_2=-A\cdot\sin\ (\omega_s 2\tau+\phi),$$

$$S_3=-A\cdot\cos\ (\omega_s 3\tau+\phi),$$

$$S_4=A\cdot\sin\ (\omega_s 4\tau+\phi),$$

$$S_5=A\cdot\cos\ (\omega_s 5\tau+\phi),$$

$$S_6=-A\cdot\sin\ (\omega_s 6\tau+\phi),\ \ldots;$$

wherein ω_s is the baseband frequency, ω_o is the IF center frequency, and ϕ is the phase of the analog input signal; and

means for processing said sequence of digital signal samples to derive either an I digital signal or a Q digital signal as a first digital output signal from a first series of alternate samples and to derive the other of the I and Q digital signals as a second digital output signal by computing the average of the absolute values of alternate samples that immediately precede and follow the samples of the first series, with the sign depending on the sampling mode (i.e. whether a=0 or a=1).

5,067,141

INTERPOLATOR FOR VARYING A SIGNAL SAMPLING RATE

David N. Critchlow; Graham M. Avis; Sandra J. K. Earlam, all of San Diego; Karle J. Johnson, Carlsbad; Bruce A. Smetana, Escondido; Gregory L. Westling, Poway, all of Calif.; Eric Paneth, Givataiim, Israel, and Moshe Yehushua, San Diego, Calif., assignors to International Mobile Machine Corporation, King of Prussia, Pa.

Division of Ser. No. 256,415, Oct. 12, 1988, Pat. No. 4,893,317, which is a division of Ser. No. 893,916, Aug. 7, 1986, Pat. No. 4,825,448. This application Oct. 10, 1989, Ser. No. 419,501

Int. Cl.[5] H04L *27/06*

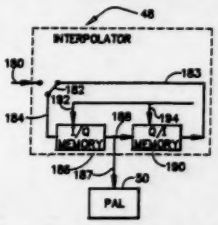
U.S. Cl. 375—97 **7 Claims**

1. An interpolator for varying the sampling rate of digital input signals having paired in-phase and quadrature components comprising;

an input means for said input signals at a first sampling rate;

a first memory for alternately storing the in-phase and quadrature components, said first memory being coupled to said input means and also being serially coupled to a second memory for alternately storing the quadrature and in-phase components;

means to circulate said input signals through both of said memories at a second and increased sampling rate whereby each in-phase and quadrature component is circulated more than once through said memories before



the next in-phase and quadrature pair of signals is input from said input means; and

output means coupled with said memories which taps the circulation of signals circulated through the memories whereby the resultant output signal is a resampled and remultiplexed signal output at said second higher rate.

5,067,142

X-RAY DIAGNOSTICS INSTALLATION WITH A GATING UNIT FOR THE DOMINANT IMAGE REGION

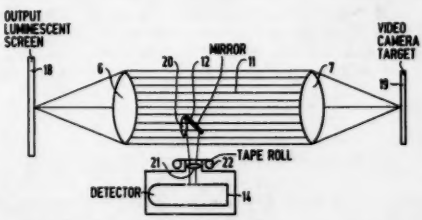
Arthur Gall, Langensendelbach, and Adelbert Kupfer, Poxdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 16, 1991, Ser. No. 641,787

Claims priority, application European Pat. Off., Jan. 15, 1990, 90100756.7

Int. Cl.[5] H05G *1/64*

U.S. Cl. 378—99 **8 Claims**



1. In an x-ray diagnostics installation for producing x-ray images having an x-ray image intensifier and means for measuring the average image brightness in a dominant image region of the output luminescent screen of the x-ray image intensifier, the improvement of a gating device disposed in a light beam path between said output luminescent screen and said detector, said gating device comprising:

a tape roll consisting of optically opaque material and having a plurality of openings therein of respectively different sizes, shapes and positions; and

means for operating said tape roll to selectively position one of said openings in said beam path to limit the light in said beam path which is incident on said detector.

5,067,143

CURRENT DETECTING CIRCUIT FOR X-RAY TUBE

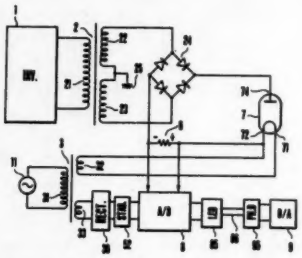
Kiyomi Watanabe, and Tetsuya Matsumoto, both of Tokyo, Japan, assignors to Origin Electric Co., Ltd., Tokyo, Japan

Filed Jun. 20, 1990, Ser. No. 541,154

Claims priority, application Japan, Jun. 26, 1989, 1-163098; May 14, 1990, 2-123660

Int. Cl.[5] H05G *1/34*

U.S. Cl. 378—110 **9 Claims**



1. A detecting circuit for detecting a current of an X-ray tube, comprising:

a DC voltage generating circuit for generating and supplying a direct current voltage across a filament and an anode of the X-ray tube;

current detecting means connected in series between a filament terminal of said X-ray tube and a terminal of said DC voltage generating circuit for detecting current passing through said X-ray tube;

an isolation transformer having a primary winding, a secondary winding for supplying a power for the filament, an additional secondary winding disposed adjacent to said secondary winding, and an insulating means disposed between said primary winding and both of said secondary and additional secondary windings, said insulating means having a sufficient dielectric strength to insulate with respect to a voltage which is the highest produced by said DC voltage generating circuit;

a rectifier circuit for rectifying a current from said additional secondary winding of said isolation transformer;

a signal transmitting circuit arranged to be powered from said rectifier circuit, said transmitting circuit being responsive to said current detecting means for transmitting an output signal;

a signal receiving circuit for receiving the output signal from said signal transmitting circuit, said signal receiving circuit being held at a ground potential; and

electrically isolated transmission means for transmitting the signal from said signal transmitting circuit to said signal receiving circuit.

5,067,144

EQUALIZED RADIOGRAPHY USING SPECIAL MODULATOR PINS

William F. Aitkenhead, Sharon, and Russell J. Gershman, Middleborough, both of Mass., assignors to Hologic, Inc., Waltham, Mass.

Filed May 18, 1990, Ser. No. 525,498

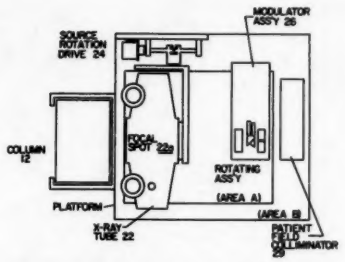
Int. Cl.[5] G21K *5/10*

U.S. Cl. 378—146 **20 Claims**

1. A system for examining an object with penetrating radiation, comprising:

a source/modulator which generates a fan of penetrating radiation scanning an object position and comprises wedge-shaped pins of a radiation attenuating material movable into the fan in the scanning direction and arranged in at least one row extending in a direction transverse to both the scanning direction and the propagation direction of said radiation;

each of said pins having a ridge pointing to or away from the origin of the fan and each pin having sections of different areas in different planes normal to the scanning direction; and



a control circuit moving said pins individually to respective degrees into the scanning fan.

5,067,145

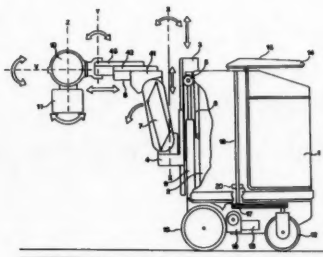
MOBILE X-RAY APPARATUS

Bernard W. Siczek, and Aldona A. Siczek, both of 1252 Chinook Way, Boulder, Colo. 80303

Filed Mar. 16, 1990, Ser. No. 494,478

Int. Cl.[5] H05G *1/02*

U.S. Cl. 378—198 **1 Claim**



1. A mobile X-ray apparatus for use in medical diagnostic examinations comprising:

a base comprising:

an X-ray generator,

a steering means,

a sensing means,

wheels supporting said bas and including at least one manually steerable wheel and one pair of wheels wherein each wheel is connected to a power means, and wherein:

said steering means are connected to the manually steerable wheel or wheels,

said sensing means are coupled to said steering means for sensing steering momentum and providing differential energizing of the power means for differentially driving said second pair of the wheels.

5,067,146

X-RAY RADIATOR

Fred Meinel, Eckental, and Dorothea Wilke, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 31, 1990, Ser. No. 606,919

Claims priority, application European Pat. Off., Nov. 9, 1989, 89120807

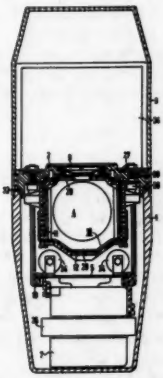
Int. Cl.[5] H01J *35/10*

U.S. Cl. 378—199 **4 Claims**

1. In an x-ray radiator having a tank and an insertable closure

forming a housing filled with coolant, and an x-ray tube having a longitudinal axis disposed in said housing, the improvement comprising:

a tube carrier which holds said x-ray tube in said housing; and



retaining means for mounting said tube carrier to said housing, said retaining means having a portion thereof accessible at an exterior of said housing for adjusting the position of said tube carrier and said x-ray tube by displacing said longitudinal axis of said x-ray tube relative to said housing.

5,067,147

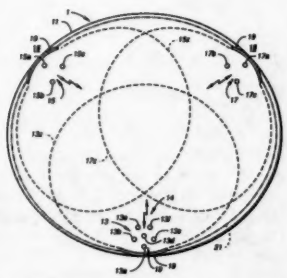
MICROCELL SYSTEM FOR CELLULAR TELEPHONE SYSTEM

William C. Lee, Corona Del Mar, Calif., assignor to PacTel Corporation, San Francisco, Calif.

Continuation of Ser. No. 432,800, Nov. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 307,070, Feb. 6, 1989, Pat. No. 4,932,049. This application Apr. 26, 1991, Ser. No. 693,779

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—60 **2 Claims**



1. A cellular telephone system comprising,

a plurality of contiguous cells, said cells being arranged in a plurality of clusters wherein each cell in a cluster has an assigned set of transmission frequencies, each of which frequencies is assignable to a given mobile telephone within said cell for all locations of said given mobile telephone within said cell,

frequency handoff means for maintaining continuous communication with mobile telephones moving from cell to cell by assigning thereto, respectively, a frequency from the corresponding assigned set as the mobile telephone moves into a new cells, each of said cells having a plurality of antenna means each of what is arranged and configured to limit propagation of signals substantially to one of a plurality of regions within the boundaries of said cell, which regions are each substantially less in area than the area of said cell but collectively occupy the entire cell area, and

means for terminating transmission by said antenna means, at any one frequency in a given assigned set of transmission frequencies for said cells in all regions except for the region wherein the strongest signal is received by said antenna means from the mobile telephone to which such one frequency has been assigned,

said clusters being arranged with a frequency reuse pattern of three and a ratio of co-channel separation distance to cell radius of less than four.

5,067,148

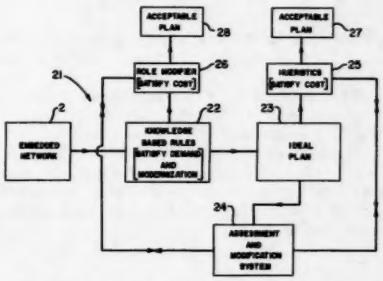
METHOD AND APPARATUS FOR PLANNING TELEPHONE FACILITIES NETWORKS

Sanjeev Sardana, Stamford, Conn., assignor to Nynex Corporation, New York, N.Y.

Filed Dec. 14, 1990, Ser. No. 627,646

Int. Cl.[5] H04M *7/00*

U.S. Cl. 379—111 **30 Claims**



1. A method for developing an acceptable plan for changing the links serving the nodes of a telephone network comprising the steps of:

developing an ideal plan for changing the links using knowledge based rules adapted to satisfy one or more first constraints;

assessing whether the ideal plan satisfies one or more second constraints and if so identifying the ideal plan as the acceptable plan;

and if the ideal plan fails to satisfy said one or more second constraints, modifying the ideal plan to satisfy at least one of said first constraints and one or more of said second constraints to realize said acceptable plan.

5,067,149

TELEPHONE LINE COMMUNICATIONS CONTROL SYSTEM WITH DYNAMIC CALL STREAMING

Michael R. Schneid, Pasadena, and John R. Prohs, Palmdale, both of Calif., assignors to Ambassador College, Pasadena, Calif.

Continuation-in-part of Ser. No. 249,220, Sep. 19, 1988, Pat. No. 4,837,799, which is a continuation of Ser. No. 106,726, Oct. 5, 1987, abandoned. This application Jun. 5, 1989, Ser. No. 362,038

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.[5] H04M *3/00*

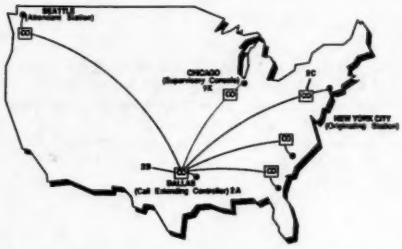
U.S. Cl. 379—224 **15 Claims**

1. A telecommunications control system for accepting a plurality of multi-purpose stations on the public switched network for use as remote attendant stations in an attendant service complex to service calls directed to the system from originating stations, the system comprising:

a first plurality of station connection controllers, each sta-

tion connection controller in the first plurality for cooperating with a respective one of a plurality of multi-purpose stations in defining opposite ends of a call connection path, and each such station connection controller having controllable switching means for opening the call connection path and releasing the respective multi-purpose station;

a second plurality of station connection controllers, each station connection controller in the second plurality for cooperating with a respective one of a plurality of originating stations in defining opposite ends of call connection path;



controllable inter-connection means arranged between the first and second plurality of station connection controllers;

means for controlling the inter-connection means such that incoming calls from originating stations are extended to multi-purpose stations that have been accepted as attendant stations; and

means for measuring the interval of time between incoming calls for each of the second plurality of station connection controllers, during which interval of time the remote attendant is online.

5,067,150

TELEPHONE NUMBER DISPLAY DEVICE

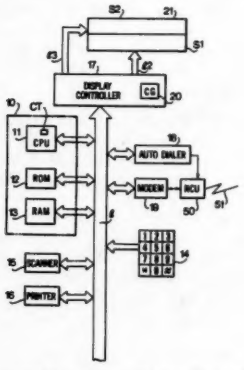
Mitsuo Satomi, Kyoto; Kazuaki Oshita, Hirakata, and Tetsuya Kuwahara, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 27, 1990, Ser. No. 485,958

Claims priority, application Japan, Mar. 1, 1989, 1-23719[U]

Int. Cl.[5] H04M *1/26*

U.S. Cl. 379—354 **4 Claims**



1. A telephone number display device adapted to a facsimile machine having a telephone function, comprising:

telephone number input means for entering a telephone number comprising a plurality of characters;

display means having first and second display areas for displaying a telephone number given by the telephone number input means, the first display area being disposed below the second display area and the first display area comprising a plurality of display positions equal in number to n, where n is an integer; and

display mode control means for controlling the display means so as to display the telephone number given by the telephone number input means in the first display area to maximum number of places thereof and, when the telephone number overflows the first display area, the telephone number is divided into two groups and displayed in the first and second display areas, the display mode control means comprising:

means for displaying the characters of the telephone number in the first display area from left to right as the characters of the telephone number are entered by the telephone number input means, and

means for transferring the first n characters of the telephone number provided by the telephone number input means from the first display area to the second display area when the number of characters of the telephone number entered by the telephone input means exceeds n,

whereby the number of characters of the telephone number in excess of n are displayed in the first display area from left to right as the characters of the telephone number are entered by the telephone number input means.

5,067,151

TELEPHONE HANDSET WITH ELECTROSTATIC DISCHARGE PREVENTION

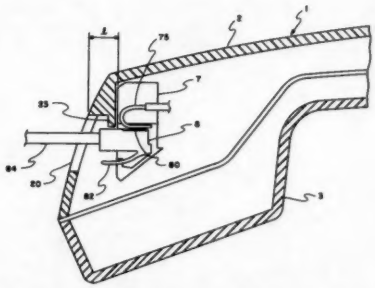
Masaru Inagaki, Tokyo, and Toshio Matsushita, Shizuoka, both of Japan, assignors to NEC Corporation, Japan

Filed Jun. 29, 1989, Ser. No. 374,084

Claims priority, application Japan, Jun. 30, 1988, 63-87743[U]

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—433 **4 Claims**



1. A telephone handset comprising a modular plug fitting on an end of a telephone cord, an electrostatic discharge prevention means connectable to a telephone body by said cord on, said modular plug having a resilient leaf spring locking tongue for locking it in place,

said handset comprising:

a modular jack having electrical contacts for receiving the modular plug, said handset having an opening through which said plug may be inserted, said jack being disposed in said handset in a position which is at least a distance of l as measured from said opening which is formed through said handset for the insertion of said plug, said distance being great enough to prevent the locking tongue of the plug from protruding from said handset to the outside thereof;

a wall molded integrally within said handset and positioned outwardly of said electrical contacts of said modular jack for concealing said electrical contacts from the opening in said hand set;

a handset cover and a handset case;

said handset cover having an interior comprising a pair of parallel first guide members positioned at opposite sides adjacent to an inner surface of said handset cover where the opening is located, and a pair of parallel second guide members which are spaced apart from said first guide members by a predetermined distance, said first and second guide members being molded integrally with said handset cover;

said wall being positioned between said first guide members; and

said modular jack being retained between said first and said second guide members.

5,067,152

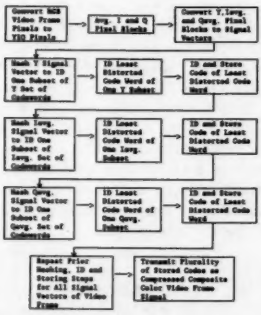
METHOD AND APPARATUS FOR VECTOR QUANTIZATION

Gregory H. Kisor, Boca Raton, Fla., and Edward J. King, Milpitas, Calif., assignors to Information Technologies Research, Inc., Boca Raton, Fla.

Continuation-in-part of Ser. No. 303,795, Jan. 30, 1989, Pat. No. 4,979,039. This application Mar. 16, 1990, Ser. No. 494,658

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—10 **16 Claims**


Convert RGB Video Frame Pixels to YIQ Pixels
Avg. I and Q Pixel Blocks
Convert Y, Avg. and Quag. Pixel Blocks to Signal Vectors
Hash Y Signal Vector to ID One Subset of Y Set of Codewords
ID Least Distorted Code Word of One Y Subset
ID and Store Code of Least Distorted Code Word
Hash Iavg. Signal Vector to ID One Subset of Iavg. Set of Codewords
ID Least Distorted Code Word of One Iavg. Subset
ID and Store Code of Least Distorted Code Word
Hash Qavg. Signal Vector to ID One Subset of Qavg. Set of Codewords
ID Least Distorted Code Word of One Qavg. Subset
ID and Store Code of Least Distorted Code Word
Repeat Prior Hashing, ID and Storing Steps for All Signal Vectors of Video Frame
Transmit Plurality of Stored Codes as Compressed Composite Color Video Frame Signal

1. A method of compressing an original signal convertible into a plurality of binary signal vectors, each signal vector containing a plurality of data elements of the original signal to be compressed, the method comprising the steps of:

hashing a first signal vector converted from the original signal to identify one of at least three different subsets of a first set of code words, each code word of the first set having a unique, associated binary code, each code associated with the first set of code words having a first predetermined length less than the length of the first signal vector;

storing a first code associated with one of the code words from the one identified subset of the first set as a compressed representation of the first signal vector;

hashing a second signal vector converted from the original signal to identify one of at least three different subsets of a second set of code words, each code word of the second set having a unique, associated binary code, each code associated with the second set of code words having a second predetermined length less than the length of the second signal vector and the second set of code words differing from the first set of code words; and

storing a second code associated with one of the code words from the one selected subset of the second set as a compressed representation of the second signal vector.

5,067,153

METHOD FOR TRANSMITTING SUBSCRIBER DATA IN COMMUNICATION SYSTEMS FROM ONE SECRET SUBSCRIBER EQUIPMENT TO ANOTHER

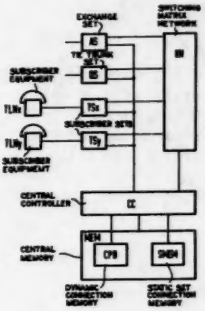
Klaus Willie; Helmut Kienberger, and Erika Marwitz, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,385

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 3932498; Nov. 15, 1989, 3938000

Int. Cl.[5] H04K *1/00, 9/00*; H04M *1/24*

U.S. Cl. 380—23 **15 Claims**



1. A method of transmitting subscriber data including the name and subscriber connection number of a calling party between a secret status calling subscriber station and a called subscriber station which has a display for displaying the subscriber data, in a receiving communication system which comprises a central controller and a central memory, comprising the steps of:

(a) storing the subscriber data and inhibit information assigned thereto in the central memory for the subscriber stations of those subscribers who are authorized a secret status;

(b) upon setup of a connection between the secret status calling subscriber station and the called subscriber station, transmitting cancel secrecy information to the central controller to activate a program-oriented identification procedure;

(c) in response to the activation of the program-oriented identification procedure, generating identification information;

(d) in response to the identification information, suppressing the inhibit information and reading the stored subscriber data of the secret status calling subscriber station from the central memory; and

(e) transmitting the read subscriber data to the called subscriber station for display.

5,067,154

TERMINAL MANAGEMENT METHOD AND APPARATUS

Yoshiyuki Hosobuchi, and Takayuki Takahashi, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1990, Ser. No. 508,110

Claims priority, application Japan, Apr. 17, 1989, 1-095112

Int. Cl.[5] H04L *9/00*

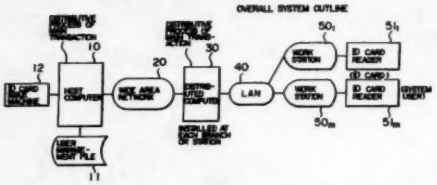
U.S. Cl. 380—25 **18 Claims**

1. A terminal management method for an information processing system including a host system, means for storing user discrimination information, and a plurality of terminal systems, each terminal system having a variably settable address that is responsive to a recording medium written with discrimination information stored in the means for storing, thereby enabling

an information processing with the host system, comprising the steps of:

recording user discrimination information in said means for storing, said user discrimination information uniquely discriminating a user, and storing in said recording medium said discrimination information specific to said discriminated user, in accordance with said user discrimination information recorded in said means for storing; and

entering said discrimination information recorded in said recording medium in any one of said plurality of terminal systems to set thereto an address of said terminal system correspondingly to said discrimination information specific to said discriminated user.



5,067,155

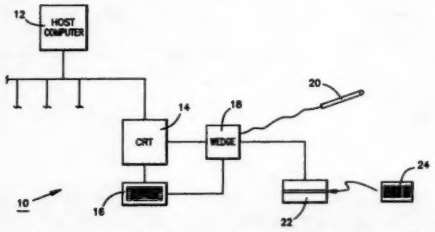
METHOD AND MEANS TO LIMIT ACCESS TO COMPUTER SYSTEMS

James S. Bianco; James T. Madsen, both of Enfield; Michael Ceppetelli, Broadbrook, all of Conn., and John S. Fahy, Agawam, Mass., assignors to Control Module Inc., Enfield, Conn.

Filed May 9, 1990, Ser. No. 520,763

Int. Cl.[5] G11B *23/28;* H04K *1/00*

U.S. Cl. 380—25 **5 Claims**



1. A method of limiting access to a computer system, said system being accessible by means of a security code, comprising:

(a) reading an identification code on identifying indicia by machine means connected to said computer system;

(b) scrambling, with said machine means, said identification code as a function of current time to produce said security code;

(c) transmitting directly from said machine means to said computer system said security code;

(d) descrambling, in said computer system, said security code to determine if said security code is valid for the then current date and time; and

(e) permitting said security code, if valid, to be used for access to said computer system for a selected interval of time only.

5,067,156

METHOD FOR GENERATING A RANDOM NUMBER FOR THE ENCODED TRANSMISSION OF DATA UPON EMPLOYMENT OF A VARIABLE STARTING VALUE

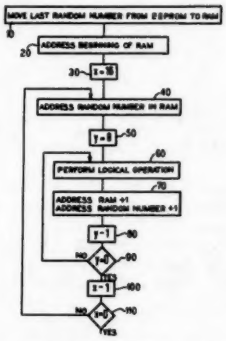
Guenter Martin, Neubaldham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 490,433

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907526

Int. Cl.[5] H04L *9/00*

U.S. Cl. 380—46 **3 Claims**



1. Method for generating a random number for the encoded transmission of data in a data exchange system having chip cards, each having a processor, using a secret cipher, a ciphering algorithm allocated to a random number generator, and a variable starting value that is logically combined with a most recently used and intermediately stored random number, comprising the steps of: performing a logical operation on every byte of the stored random number with a respective byte of each data block of a plurality of data blocks in the working memo the processor, each data block being n-bytes wide; and using the result of this multiple operation as a starting value for generating a new random number.

5,067,157

NOISE REDUCTION APPARATUS IN AN FM STEREO TUNER

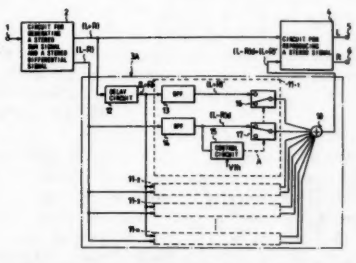
Kohji Ishida; Yasushi Nishimura, and Shigeru Yamaguchi, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 29, 1989, Ser. No. 442,770

Claims priority, application Japan, Feb. 3, 1989, 1-25296; Feb. 3, 1989, 1-25297

Int. Cl.[5] H04H *5/00*

U.S. Cl. 381—13 **9 Claims**



1. A noise reduction apparatus in an FM stereo tuner comprising:

a circuit for generating a stereo sum signal and a first stereo differential signal;

a noise eliminating circuit for dividing said stereo sum signal and said first stereo differential signal, in accordance with a plurality of frequency bands, into a plurality of divisional differential signals and a plurality of divisional sum signals, for eliminating a low-level divisional stereo differential signal in each of said plurality of frequency bands so as to output a second differential signal representing those first differential signals not eliminated, and for outputting a composite signal representing the second stereo differential signal and only those divisional stereo sum signals in the same divisional band as said eliminated divisional stereo differential signals; and

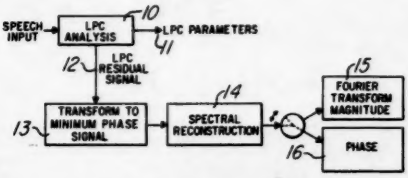
a circuit for reproducing a stereo signal from said composite signal and said stereo sum signal.

5,067,158

LINEAR PREDICTIVE RESIDUAL REPRESENTATION VIA NON-ITERATIVE SPECTRAL RECONSTRUCTION

Masud M. Arjmand, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 11, 1985, Ser. No. 744,171
Int. Cl.[5] G10L 7/06
U.S. Cl. 381—51 **11 Claims**



1. A method of encoding a linear predictive residual signal as derived from an analog speech signal, wherein said linear predictive residual signal is in the form of a plurality of frames of digital speech data, said method comprising the steps of:

transforming each frame of digital speech data to a frame of digital speech data at least approximating minimum phase; and

subjecting the transformed frame of digital speech data at least approximating minimum phase to a Fourier Transform procedure, thereby providing an encoded version of the frame in which one of the magnitude and the phase information is representative of the original frame of digital speech data which forms part of the original linear predictive residual signal, and the other of the magnitude and the phase information does not occur in the encoded version of the frame.

5,067,159

STRUCTURE OF A SPEAKER APPARATUS

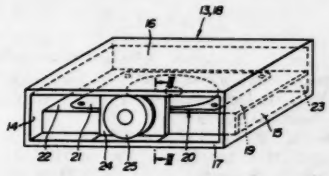
Junichi Kasai; Wataru Yagihashi, both of Kanagawa; Akira Yatsunami, Saitama, and Kazuyuki Kurano, Saitama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Clarion Company, Limited, Tokyo, both of, Japan

Filed Jul. 13, 1988, Ser. No. 218,261
Claims priority, application Japan, Jul. 14, 1987, 62-175327
Int. Cl.[5] H04R 1/02
U.S. Cl. 381—90 **17 Claims**

1. A speaker apparatus, comprising:

(a) a speaker unit having a vibrating plate thereon;

(b) a cabinet of substantially rectangular cross section having a partitioning plate in a space between an upper plate portion and a bottom plate portion thereof, the speaker unit being installed on the partitioning plate so that a front surface of the vibrating plate of the speaker unit is faced against an opposing surface of the upper plate portion via the space within the cabinet, the cabinet having a first opening provided along a lower part of a first side plate portion between the upper plate portion and bottom plate portion, the first opening serving as an exit for sound wave signals generated from a rear surface of the vibrating plate of the speaker unit, and having a second opening provided along an upper part of a second side plate portion of the cabinet between the upper plate portion and bottom plate portion, the second opening serving as an exit for the sound wave signals generated from the front surface of the vibrating plate and reflected against the opposing surface of the upper plate portion of the cabinet; and



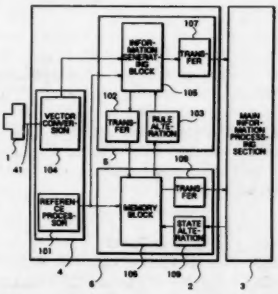
(c) means, located over a predetermined part of the second opening, for shielding the sound wave signals distorted due to peaks and dips of the sound wave signals in a particular frequency band caused by repeated reflections between the front surface of the vibrating plate and the opposing surface of the upper plate portion from propagating over the predetermined part of the second opening in the direction toward an outer surface of the predetermined part and for reproducing the sound wave signals generated from the front surface of the vibrating plate of the speaker unit in the particular frequency band so as to compensate for the sound wave signals which have peaks and dips in the particular frequency band.

5,067,160

MOTION-PATTERN RECOGNITION APPARATUS

Satoshi Omata, Machida; Hiroshi Shimizu, and Yoko Yamaguchi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,547
Claims priority, application Japan, Apr. 26, 1988, 63-102920
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 **26 Claims**



1. A motion-pattern recognition apparatus for recognizing the motion of an object contained in time-varying image data, comprising:

input means arranged for input of time-varying image data;

arithmetic means connected to said input means for computing vectors indicative of local variations in the input time-varying image data;

image forming means connected to said arithmetic means for forming an image corresponding to the motion of the

object from said vectors computed by said arithmetic means in accordance with a predetermined rule;

memory means for retrievably storing in advance different kinds of conceptualized meanings of motion;

retrieving means connected to said image forming means and said memory means for retrieving a conceptualized meaning close to the image formed by said image forming means; and

rule altering means connected to said retrieving means and said image forming means for altering said predetermined rule on the basis of said conceptualized meaning retrieved by said retrieving means.

5,067,161

IMAGE RECOGNITION DEVICE

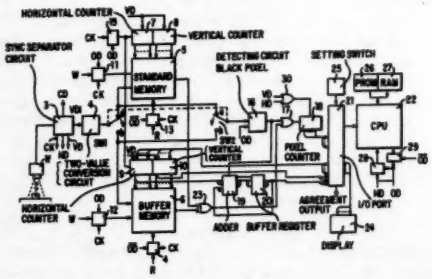
Kazuo Mikami, Kyoto; Hideshi Ishihara, Takatsuki; Masahiro Nishimura, Kyoto; Noriyuki Tsukiyama, and Seisuke Hinoda, both of Uji, all of Japan, assignors to Omron Tateisi Electronics Co., Nagaokakyo, Japan

Continuation of Ser. No. 752,737, Jul. 8, 1985, abandoned. This application Aug. 3, 1988, Ser. No. 228,836

Claims priority, application Japan, Jul. 9, 1984, 59-143072

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—1 **1 Claim**



1. A visual recognition device which receives video signals representing an object to be recognized from a video camera, converts said video signals to a two-valued input pattern, and compares said input pattern with a standard pattern to recognize said object, comprising:

an auxiliary computing means for carrying out a predetermined auxiliary computation during a horizontal scan period of said video camera, according to a state of the input pattern;

a main computation means for performing a main computation operation based on computation results of said auxiliary computation means, said main computation operation being carried out only during a vertical return scan blanking period of said video camera; and

a recognition means for recognizing said input pattern with respect to said standard pattern based on said computation results of said main computation means with respect to said patterns.

5,067,162

METHOD AND APPARATUS FOR VERIFYING IDENTITY USING IMAGE CORRELATION

Edward C. Driscoll, Jr., Portola Valley; Craig O. Martin, Menlo Park, both of Calif.; Kenneth Ruby, Florence, Oreg.; James J. Russell, Mountain View, and John G. Watson, Menlo Park, both of Calif., assignors to Identix Incorporated, Sunnyvale, Calif.

Filed Jun. 30, 1986, Ser. No. 879,987

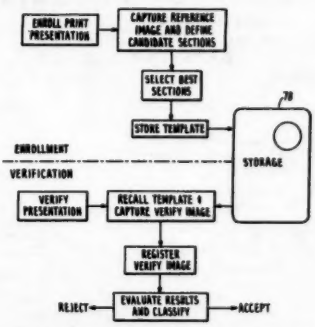
Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—5 **48 Claims**

1. An image correlation method for verifying the identity of an object, said method comprising the steps of:

forming a two-dimensional reference image of a reference object;

identifying a plurality of two-dimensional reference sections from said reference image by the steps of partitioning said reference image into a plurality of two-dimensional candidate reference sections from which said reference sections will be selected, performing an autocorrelation calculation for each candidate reference section to determine the degree of distinctiveness of said candidate reference section relative to a two-dimensional local region of said reference section by comparing pixels of the two-dimensional image data of said candidate reference section to corresponding pixels of the two-dimensional image data of equal-sized areas throughout said local region, wherein said local region is larger than said candidate reference section and smaller than said reference image, and selecting said reference sections from the most distinctive of said candidate reference sections based on the results of the autocorrelation calculations; and then



forming a two-dimensional verify image of an object whose identity is to be verified, wherein said verify image includes a plurality of two-dimensional verify regions each corresponding in position to one of said reference sections and each larger in extent than its corresponding reference section;

determining a best-match location within each verify region at which the image data is most similar to the image data of its corresponding reference section;

determining the relative positioning of said best-match locations relative to each other and comparing that positioning to the relative positioning of the reference sections relative to each other; and

verifying the identity of said object according to the degree of similarity between the image data of said best-match locations and said corresponding reference sections, and according to the degree of similarity between the relative positioning of said best-match locations and the relative positioning of said corresponding reference sections.

5,067,163

METHOD FOR DETERMINING A DESIRED IMAGE SIGNAL RANGE FROM AN IMAGE HAVING A SINGLE BACKGROUND

Yuuma Adachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 27, 1989, Ser. No. 413,159

Claims priority, application Japan, Sep. 28, 1988, 63-243436

Int. Cl.[5] G06K *9/38;* **H05B** *33/00;* **G03G** *5/16;* **G06F** *15/00*

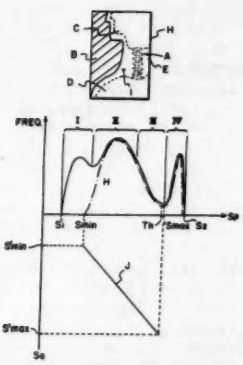
U.S. Cl. 382—6 **3 Claims**

1. A method for finding a desired image signal range of an image signal representative of an image having an object image portion and a single background region, which comprises the steps of:

i) converting said image signal, which is made up of a plural-

ity of image signal components whose values represent picture elements of said image, into a two-valued system using a predetermined threshold value in order to form a binary image which comprises a region approximately corresponding to the object image and a region approximately corresponding to the background region,

creating a second area defining a region approximately corresponding to the background region by reassigning the picture element corresponding to the image signal component having the value closest to said predetermined threshold value from the image signal components corresponding to all or some of the picture elements, which are located in said region approximately corresponding to the object image and which constitute and edge of said binary



image, to said second area defining the region approximately corresponding to the background region, thereby forming the background region out of two areas which are separated by said region approximately corresponding to the object image,

iii) repeating the formation of the binary image with the said predetermined threshold value being changed sequentially so that said two areas which form said region approximately corresponding to the background region expand until they become connected to each other, and

iv) finding the desired image signal range from the values of the image signal components corresponding to the picture elements located in said two areas which have become connected to each other through the performance of step (iii) herein.

5,067,164

HIERARCHICAL CONSTRAINED AUTOMATIC LEARNING NEURAL NETWORK FOR CHARACTER RECOGNITION

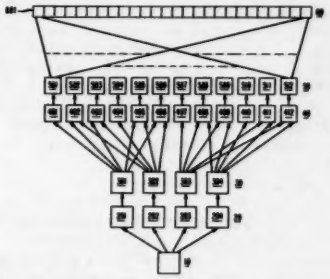
John S. Denker, Leonardo; Richard E. Howard, Highland Park; Lawrence D. Jackel, Holmdel, and Yann LeCun, Middletown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 30, 1989, Ser. No. 444,455
Int. Cl.[5] G06K 9/62
U.S. Cl. 382—15 **5 Claims**

1. A massively parallel computation network for character recognition of an image map having a plurality of image units, said network comprising

first and second feature detection layer means wherein each of said feature detection layer means includes a plurality of constrained feature maps and a corresponding plurality of feature reduction maps, each constrained feature map and each feature reduction map comprising a plurality of units and a corresponding plurality of computation elements for generating values for said units in said map, each of said feature reduction maps having fewer units than each of said constrained feature maps, said computation element having a weighting kernel associated therewith and being responsive to a plurality of substantially neighboring units from at least a predetermined other map for mapping a dot product of said associated weighting kernel with said predetermined plurality of substantially neighboring units into an output value in accordance with a selected nonlinear criterion, said computation element responsive to a different plurality of substantially neighboring units than each other computation element associated with the same map, said second feature detection layer means having fewer units than said first feature detection layer means,

said constrained feature maps of said first feature detection



layer means responsive to image units, each feature reduction map of said first feature detection layer means responsive to units from its corresponding constrained feature map, said constrained feature maps of said second feature detection layer means responsive to units from at least one feature reduction map in said first feature detection layer means, each feature reduction map of said second feature detection layer means responsive to units from its corresponding constrained feature map,

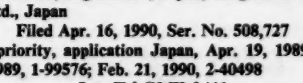
said network further including a character classification layer fully connected to all feature reduction maps of said second feature detection layer means for generating an indication representative of the character recognized by the network.

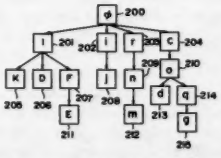
5,067,165

CHARACTER RECOGNITION METHOD

Hirobumi Nishida, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Apr. 16, 1990, Ser. No. 508,727
Claims priority, application Japan, Apr. 19, 1989, 1-99575; Apr. 19, 1989, 1-99576; Feb. 21, 1990, 2-40498
Int. Cl.[5] G06K 9/46
U.S. Cl. 382—19 **5 Claims**





1. A method for recognizing a character string comprising one or more alphanumeric characters read from a document,

said character string being defined by a first end and a second end, each of the alphanumeric characters comprising a plurality of structural elements disposed with a predetermined geometrical relationship so as to form the alphanumeric character, said method comprising the processes of:

(a) providing a dictionary having each alphanumeric character stored as a graph, the graph comprising nodes and links connecting the nodes;

(1) each of the nodes corresponding to one of the structural elements and carrying an attribute representative thereof; and

(2) each of the links representing the geometrical relationship which exists between the nodes which are connected by the link;

(b) reading a character string from a document;

(c) extracting one or more structural elements and a geometrical relationship existing therebetween from the character string read from the document, starting from a starting location of character recognition at the first end of the character string and proceeding consecutively to the second end of the character string;

(d) verifying that the structural elements and the geometrical relationship extracted in the process of extraction exist in the dictionary, wherein said step of verifying includes searching the dictionary:

(1) starting from a simple alphanumeric character having a small number of structural elements; and

(2) proceeding to complex alphanumeric characters having a large number of structural elements;

(e) predicting the structural elements and the geometrical relationship existing in the character string at a location immediately adjacent to the former location in the character string, based on the result of the process of verification, by assuming a candidate character; and

(f) recognizing the character string by moving the location step by step consecutively along the character string towards the second end, while repeatedly performing the processes of extraction, verification, and prediction in each of the steps.

5,067,166

METHOD AND APPARATUS FOR DP MATCHING USING MULTIPLE TEMPLATES

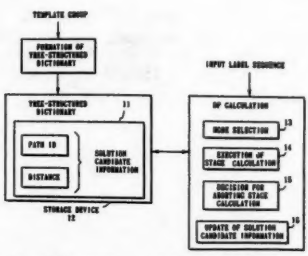
Nobuyasu Ito, Kawasaki, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1990, Ser. No. 498,310

Claims priority, application Japan, Mar. 24, 1989, 1-70442

Int. Cl.[5] G06K *9/68*

U.S. Cl. 382—37 **14 Claims**



1. A method for DP matching multiple label-sequences which form templates comprising the steps of:

(a) generating from said multiple label-sequences a tree-structured dictionary having a root node, a plurality of intermediate nodes, a plurality of end nodes, and a plurality of paths from the root node through intermediate nodes to end nodes, each intermediate and each end node having only one incoming path segment from the root node to the intermediate node, each intermediate node having one ancestor node adjacent to the intermediate node along the incoming path segment into the intermediate node, each intermediate node having at least one outgoing path segment from the intermediate node to an end node, each intermediate node having one or more descendent nodes adjacent to the intermediate node along the outgoing path segments from the intermediate node, where each node corresponds to one label, and storing it in a storage device,

(b) providing such label node in said tree-structured dictionary with a buffer area in said storage device,

(b1) selecting an ancestor node in said tree-structured dictionary, said selected ancestor node having at least two descendent nodes,

(c) selecting one descendent node of the two or more descendent nodes of the selected ancestor node, performing a stage calculation between the label corresponding to the selected descendent node and an input label sequence and storing the result in the buffer provided for the selected descendent node, the step (c) comprising the sub-steps of:

(c1) referring to the stage calculation result stored in the buffer for the selected ancestor node,

(c2) determining a label in the input label sequence providing the minimum value of the stage calculation result obtained in said sub-step (c1) and

(c3) selecting a descendent node of the selected ancestor node, which descendent node corresponds to a label having the minimum distance from a label immediately after the label determined in the sub-step (c2) in the input label sequence, and

(d1) if the selected descendent node is not an end node, then replacing the selected ancestor node with the selected descendent node, and repeating step (c), and

(d2) after performing the stage calculation for the node which corresponds to the end of one template, storing the stage calculation result obtained for the end node with the identification data of the template as solution candidate information into said storage device.

5,067,167

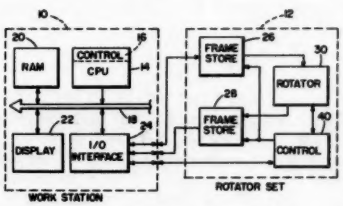
APPARATUS AND METHOD FOR ROTATING OF THREE-DIMENSIONAL IMAGES

Scott B. Berger, New York, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Oct. 10, 1990, Ser. No. 595,233

Int. Cl.[5] G06K *9/32, 9/54;* G06F *15/00;* G09G *1/06*

U.S. Cl. 382—46 **7 Claims**



1. A system for rotating a three-dimensional image so that a selected projection thereof is oriented to a chosen angular orientation in a three-dimensional space, said three-dimensional image comprising a plurality of pixels, each said pixel identified by a three-dimensional spatial coordinate value and a grey scale value, said system comprising:

data processing means for storing said pixel coordinates, and including means for rapidly altering said pixel spatial coordinate values to accomplish 90° rotations of said three-dimensional image about axes of said three-dimensional space;

a pipeline processor for altering pixel spatial coordinate values to rotate a three-dimensional image to an arbitrary angle, but only about an axis perpendicular to a rotator plane of said three-dimensional space;

means for controlling said data processing means to modify spatial coordinate values of said three-dimensional image to rotate said image through said three-dimensional space until said selected projection of said image is coplanar with said rotator plane in order to obtain an oriented three-dimensional image; and

means for controlling said pipeline processor to to rotate said oriented three-dimensional image to said chosen angle about said perpendicular axis to said rotator plane.

5,067,168

READER FOR ORIGINAL DOCUMENTS AND METHOD

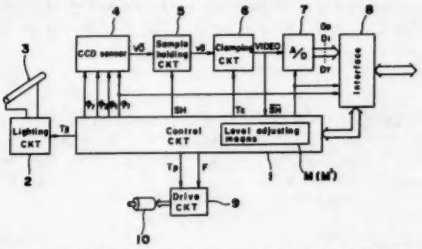
Fumikazu Nagano, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 9, 1990, Ser. No. 520,888

Claims priority, application Japan, May 16, 1989, 1-122542

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—53 **14 Claims**



1. In a reader in which a quantity of light emitted from a light source can be turned on in response to a lighting signal from a control circuit and the light can be reflected by an original document or transmitted through the original document for reading by a solid image sensor receiving a clock signals from said control circuit so as to be converted into an analog signal and that analog signal is convertible by an A-D converter into a digital image signal having a predetermined number of bits, the improvement comprising:

the control circuit including a level adjusting means for adjusting a while level of the analog signal to a reference white level, prior to a reading of the original document, by detecting a white level of an analog signal produced by light from the original document and comparing the detected white level to a reference white level;

said level adjusting means outputting, prior to reading the original document, the clock signal for increasing or decreasing a period for storing electric charge in said solid image sensor so that a value of the analog signal which is read from the original document will have the reference white level and will be inputted to said A-D converter to be converted into a full-range digital image signal by said A-D converter, independent of the density of the original document;

5,067,169

PORTABLE HUMIDIFIER

Bernard Chiu, Ashland, Mass., assignor to Duracraft Corporation, Sudbury, Mass.

Filed Aug. 1, 1990, Ser. No. 560,957

Int. Cl.[5] H05B *3/78, 11/0*; F22B *1/16*

U.S. Cl. 392—406 **14 Claims**

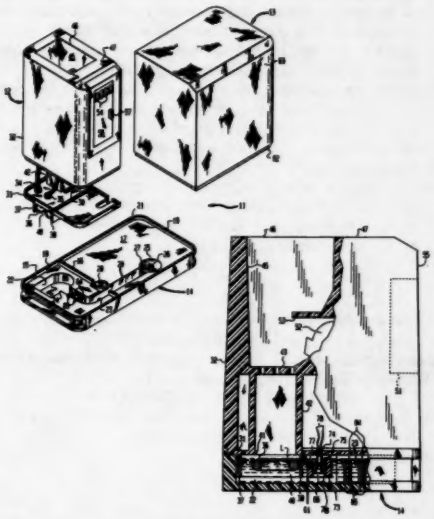
1. A humidifier comprising:

a base means defining a boiler cavity;

a liquid supply means supported on said base means and having a discharge opening communicating with said boiler cavity and adapted to maintain a given level of liquid therein;

an evaporation unit removably mounted on said base means and comprising an electrically energized heater means projecting into said cavity and adapted to induce evaporation of liquid contained thereby, and a vapor passage defining means having a receiving end communicating with said cavity so as to receive Vapor therefrom and a discharge end for discharging the vapor received from said cavity;

electrical supply means for supplying electrical energy to said evaporator means; and



an enclosure means mounted on said evaporation unit and defining a restricted chamber enclosing said heater means, a lower portion of said enclosure means defining orifice means providing liquid communication between said cavity and said chamber and physical access to said heater means so as to permit cleaning thereof.

5,067,170

ELECTRIC WATER WARMING SYSTEM

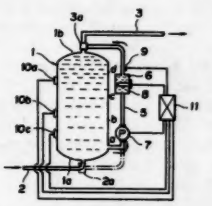
Seiko Nagashima, Ibaraki, and Takanobu Serizawa, Susono, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1989, Ser. No. 457,496

Claims priority, application Japan, Jan. 5, 1989, 64-629

Int. Cl.[5] F24H *1/18*

U.S. Cl. 392—461 **5 Claims**



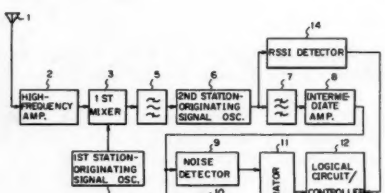
1. An electric water warming system comprising:

a first water storage tank to be installed in a vertical fashion;
a water feed pipe means connected to a bottom portion of said first water storage tank for feeding water therein;
a hot water flow-out pipe means connected to a top portion of said first water storage tank for flowing out not water therefrom;
a first detecting means for detecting a temperature of hot water stored in te first water storage tank at a plurality of levels thereof;
a circulation pipe means for circulating water from a water feed side to a hot water flow-out side of said first water storage tank;
a second water storage tank incorporated in said circulation pipe means, said second water storage tank having an inlet portion and an outlet portion;
a heating means disposed in said second water storage tank;
a second detecting means disposed at the outlet portion of said second water storage tank for detecting a temperature of hot water stored in said second water storage tank, said second detecting means comprising a temperature sensor mounted on said circulation pipe means near the outlet portion of said second water storage tank;
a pump means incorporated in said circulation pipe means at a portion between an upstream side of said second water storage tank and a downstream side of said first water storage tank to circultate water in said circulation pipe means; and
means for controlling said heating means, said first and second detecting means and said pump means, and regulating temperatures of the hot waters through said first and second detecting means.

5,067,171
METHOD AND APPARATUS FOR HAND-OFF OF CALL IN PROGRESS

Minori Kawano, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,634
Claims priority, application Japan, Mar. 31, 1987, 62-79942
Int. Cl.[5] H04Q *7/04*
U.S. Cl. 455—33 **35 Claims**



1. In a small-cell mobile radio communication system having a central switching office provided with a hand-off apparatus for determining optimal timing of a hand-off of a call-in-progress and for sending out a hand-off signal at the determined time of a hand-off, a plurality of base stations and a mobile station,

said hand-off apparatus including:

a signal input means for receiving and amplifying a high-frequency signal from a mobile station and for converting the amplified signal into an intermediate-frequency signal;

a signal-to-noise ratio detecting means connected to said signal input means for converting the intermediate-frequency signal into a voice signal, for detecting the signal-to-noise ratio of the voice signal, and for outputting a first on-state signal when the detected signal-to-noise ratio exceeds to equals a predetermined first threshold and a first off-state signal when the detected signal-to-noise ratio is below the first threshold;

a received signal strength input detecting means connected to said signal input means for detecting and received signal strength input of the intermediate-frequency signal independently of said signal-to-noise ratio detecting means, for outputting a second on-state signal when the detected received signal strength input exceeds or equals a predetermined second threshold and a second off-state signal when the detected received signal strength input is below the second threshold; and

control logic means connection to both said signal-to-noise ratio detecting means and said received signal strength input detecting means for selecting the outputs from said signal-to-noise ratio and received signal strength input detecting means, for measuring a first total length of time in which at least one of the signal-to-noise ratio and the received signal strength input is below said corresponding first or second threshold, respectively, by counting said first or second off-state signals, for evaluating the ratio of said first total length of time to a predetermined measuring time of the signal-to-noise ratio and received signal strength input, and for sending out a hand-off signal when the evaluated ratio exceeds a predetermined third threshold thereby determining optimal timing of a hand-off of a call-in-progress.

5,067,172
AIR TO GROUND COMMUNICATIONS SYSTEM AND METHOD

Gerald R. Schloemer, Edwards Subdivision, P.O. Box 307, Round Lake, Ill. 60073

Filed May 30, 1989, Ser. No. 358,147
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 455—34 **3 Claims**

3. A radio telephone communications system selectively providing air-to-ground communications between a plurality of bases each having transmitters and receivers and a plurality of aircraft each having transmitters and receivers, transmitting means for providing signal transmitting patterns from said aircraft each pattern being substantially an inverted cone and covering areas on the ground dependent upon the height of the aircraft, means for assigning frequency channels for transmission and reception based upon the amplitude of signals received at base sites independently of locations and altitudes of aircraft, means evaluating all communicating signals present in the system, and means for assigning a channel to each aircraft to provide a coverage which does not interfere with signals from any other aircraft or base site.

5,067,173
MICROCELLULAR COMMUNICATIONS SYSTEM USING SPACE DIVERSITY RECEPTION

Alexander Gordon, Rutherford, and George P. Vella-Coleiro, Summit, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 20, 1990, Ser. No. 630,674
Int. Cl.[5] H04B *1/00*; H04M *11/00*
U.S. Cl. 359—152 **15 Claims**

12. A microcellular communications system comprising:

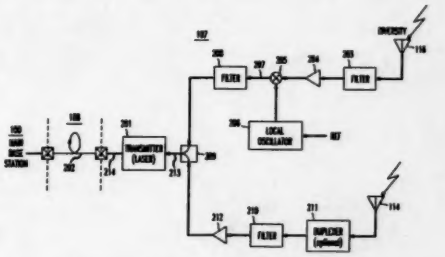
a first antenna for receiving radio signals in a first range of radio frequencies;

a diversity antenna for receiving radio signals in the first range of radio frequencies;

frequency down conversion means coupled to the diversity antenna for reducing the frequency range of signals received at the diversity antenna;

combining means coupled to the first antenna and the frequency conversion means for generating combined signals in two different frequency bands;

a laser transmitter coupled to the combining means for generating an optical wavelength carrier signal modulated by the combined signals; and



an optical transmission path coupled to the laser transmitter for transmitting the optical carrier signal to a remote cellular base station.

DESIGN PATENTS

GRANTED NOV. 19, 1991

ERRATA

For CLASS	See PATENT NO.
D007-622	321,654
D021-238	321,742
D022-142	321,744

DESIGNS

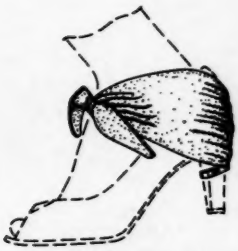
NOVEMBER 19, 1991

321,580
COMBINED ICE CREAM AND CONE THEREFOR
Curt D. Jones, 571 New Cir. NE., Lexington, Ky. 40505
Filed Dec. 7, 1988, Ser. No. 280,892
Term of patent 14 years
U.S. Cl. D1—116

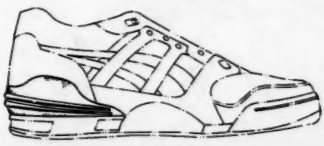
321,581
COMBINED CAP AND RADIO
Shing-Lam Li, Tuen Mun, Hong Kong, assignor to Antibes, Inc., Monrovia, Liberia
Filed Aug. 7, 1989, Ser. No. 390,335
Term of patent 14 years
U.S. Cl. D2—244

321,582
LEGGING
Ellen J. Pennington, 526 Anderson, Apt. 2, Franklin, Ohio 45005
Filed Nov. 2, 1989, Ser. No. 430,790
Term of patent 14 years
U.S. Cl. D2—267

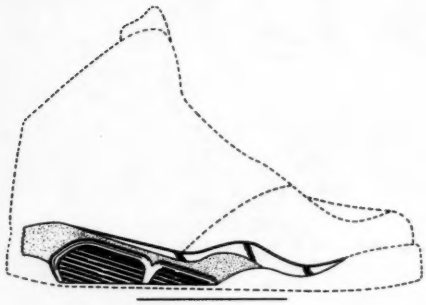
321,583
HEEL PROTECTOR
Gladys McCoy, 6650 N. Amherst, Portland, Oreg. 97203
Filed Apr. 3, 1989, Ser. No. 334,588
Term of patent 14 years
U.S. Cl. D2—277



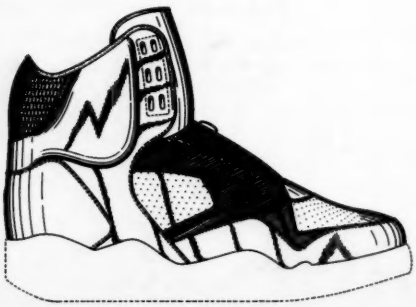
321,584
SHOE HEEL PROTECTOR
Shigeyuki Mitsui, Kobe, Japan, assignor to ASICS Corporation, Kobe, Japan
Filed May 19, 1989, Ser. No. 354,259
Claims priority, application Japan, Nov. 25, 1988, 63-46220
Term of patent 14 years
U.S. Cl. D2—277



321,585
SURFACE ORNAMENTATION FOR THE SIDES OF A SHOE MIDSOLE
Bruce E. Rogers, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 15, 1990, Ser. No. 539,523
Term of patent 14 years
U.S. Cl. D2—314

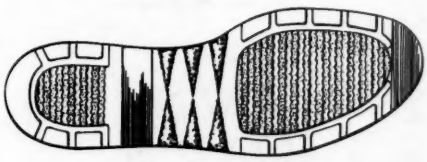


321,586
SHOE UPPER
Michael A. Aveni, Lake Oswego, Oreg., assignor to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Jun. 14, 1990, Ser. No. 537,766
Term of patent 14 years
U.S. Cl. D2—314

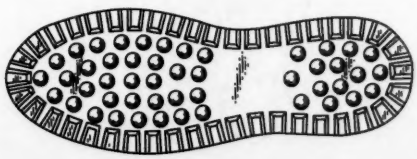


321,587
SHOE SOLE
Yoshiaki Hase, Kobe, Japan, assignor to ASICS Corporation, Kobe, Japan
Filed Mar. 23, 1989, Ser. No. 327,566
Claims priority, application Japan, Sep. 27, 1988, 63-38126
Term of patent 14 years
U.S. Cl. D2—320

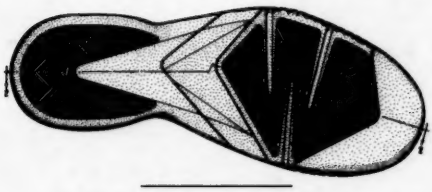
321,588
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H. H. Brown Shoe Company, Inc., New York, N.Y.
Filed Sep. 1, 1989, Ser. No. 402,144
Term of patent 14 years
U.S. Cl. D2—320



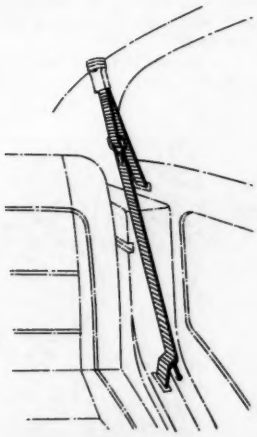
321,589
SHOE SOLE
Eric E. Merk, Portland, and Rodney E. Boast, Gresham, both of Oreg., assignors to Danner Shoe Manufacturing Co., Portland, Oreg.
Filed May 29, 1990, Ser. No. 529,254
Term of patent 14 years
U.S. Cl. D2—320



321,590
SHOE SOLE BOTTOM
Wilson W. Smith, III, Portland, Oreg., assignor to Nike Inc. and Nike International Ltd., Beaverton, Oreg.
Filed Mar. 22, 1991, Ser. No. 673,663
Term of patent 14 years
U.S. Cl. D2—320



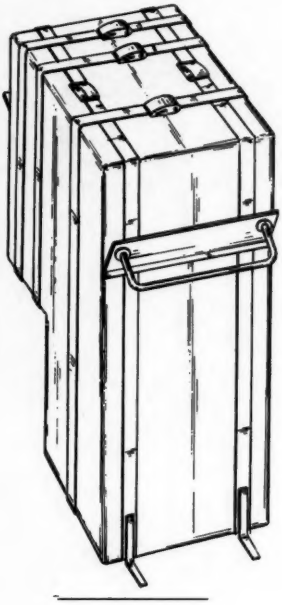
321,591
SAFETY BELT FOR CARS
Hendrikus F. Marinussen, Beek en Donk, Netherlands, assignor to Volvo Car B.V., Steenovenweg, Netherlands
Filed Dec. 30, 1986, Ser. No. 947,923
Term of patent 14 years
U.S. Cl. D2—627



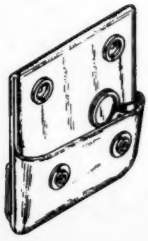
321,592
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'Totes', Incorporated, Loveland, Ohio
Filed Jan. 23, 1991, Ser. No. 645,008
Term of patent 14 years
U.S. Cl. D3—12

321,593
LUGGAGE CASE
Hyun S. Kim, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.
Filed Oct. 17, 1988, Ser. No. 258,337
Term of patent 14 years
U.S. Cl. D3—71

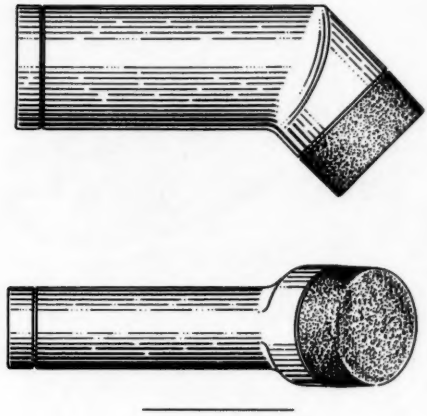
321,594
AIRPLANE SEAT ATTACHABLE BAG
John R. Bennetts, 54 Solomon St., Palmyra, Western Australia, Australia 6157
Filed Sep. 13, 1988, Ser. No. 243,764
Term of patent 14 years
U.S. Cl. D3—77



321,595
MOUNTABLE POUCH
Charles P. Costello, 1600 Alpine Ave., Boulder, Colo. 80304
Filed Jul. 31, 1989, Ser. No. 386,960
Term of patent 14 years
U.S. Cl. D3—106

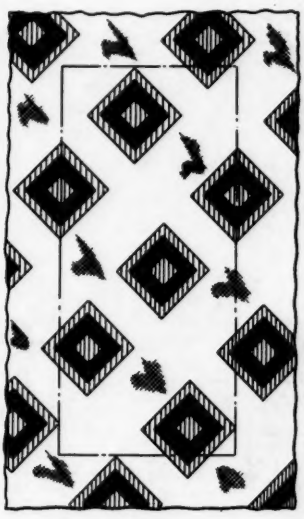


321,596
SHOE POLISH APPLICATOR
Clarence D. Zierhut, Richardson, Tex., assignor to King Imports, Inc., San Antonio, Tex.
Filed Feb. 13, 1989, Ser. No. 309,537
Term of patent 14 years
U.S. Cl. D4—114



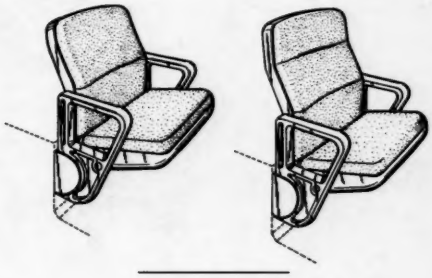
321,597
TEXTILE FABRIC
Rudolf Cerny, Steinfurt, Fed. Rep. of Germany, assignor to Arnold Kock GmbH u. Co. KG, Steinfurt, Fed. Rep. of Germany
Filed Aug. 23, 1988, Ser. No. 235,338
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 8MRBd.5B1.660
Term of patent 14 years
U.S. Cl. D5—55

321,598
TEXTILE FABRIC
Rudolf Cerny, Steinfurt, Fed. Rep. of Germany, assignor to Arnold Kock GmbH u. Co. KG, Steinfurt, Fed. Rep. of Germany
Filed Aug. 23, 1988, Ser. No. 235,339
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1988, 8MRBd.5B1.660
Term of patent 14 years
U.S. Cl. D5—61

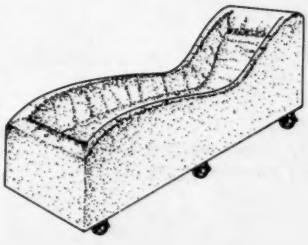


321,599
CHAIR FOR A BABY
Takehiko Takahashi; Yoshiyasu Ishii, and Hiroaki Matsuda, all of Tokyo, Japan, assignors to Combi Co. Ltd., Tokyo, Japan
Filed Oct. 19, 1988, Ser. No. 260,326
Claims priority, application Japan, Apr. 21, 1988, 63-15949
Term of patent 14 years
U.S. Cl. D6—333

321,600
THEATER SEAT
James W. Brennan, Bankstown, Australia, assignor to Sebel Furniture Limited, Bankstown, Australia
Filed Dec. 4, 1987, Ser. No. 129,102
Term of patent 14 years
U.S. Cl. D6—362

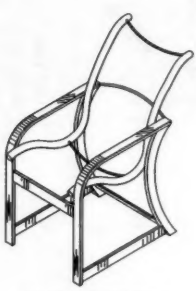


321,601
CHAISE LONGUE
Paul J. Zanki, Geebung, Australia, assignor to Qfoam Pty. Ltd., Geebung, Australia
Filed Nov. 30, 1988, Ser. No. 278,150
Claims priority, application Australia, May 31, 1988, 1794/88
Term of patent 14 years
U.S. Cl. D6—361

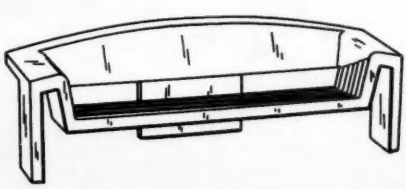


321,602
CHAIR FRAME
Herbert C. Saiger, Troy, Ohio, assignor to Crown Leisure Products, Inc., Owosso, Mich.
Filed Sep. 13, 1988, Ser. No. 243,697
Term of patent 14 years
U.S. Cl. D6—379

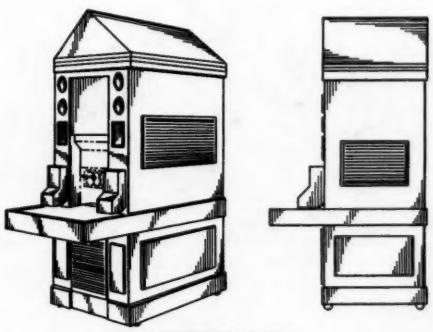
321,603
CHAIR FRAME
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Inc., Birmingham, Ala.
Filed Nov. 17, 1988, Ser. No. 272,863
Term of patent 14 years
U.S. Cl. D6—379



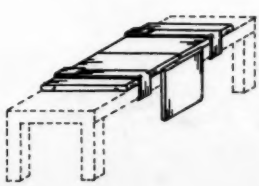
321,604
BENCH
Emilio F. París, Barcelona, Spain, assignor to Hijo De E. F. Escofet S.A., Barcelona, Spain
Filed Nov. 29, 1988, Ser. No. 277,273
Claims priority, application Spain, May 31, 1988, 116.103
Term of patent 14 years
U.S. Cl. D6—381



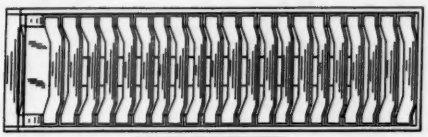
321,605
MODULAR FROZEN YOGURT DISPENSING KIOSK OR SIMILAR ARTICLE
Mark K. Gordon, Carrollton, and David W. Boyd, Grand Prairie, both of Tex., assignors to I Can't Believe It's Yogurt, Ltd., Dallas, Tex.
Filed May 25, 1990, Ser. No. 529,938
Term of patent 14 years
U.S. Cl. D6—396



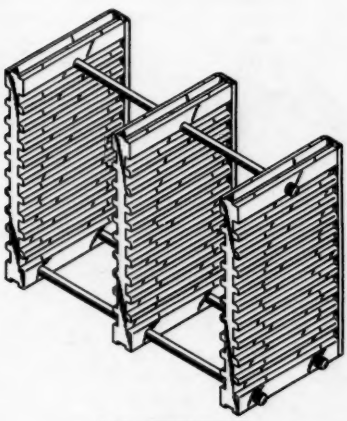
321,606
FOLDABLE INSTRUMENT MAT AND CARRIER POCKET COMBINATION
Steven J. McKinney, and Mary J. McKinney, both of North Little Rock, Ark., assignors to Instrumat, Inc., North Little Rock, Ark.
Filed Apr. 1, 1988, Ser. No. 176,414
Term of patent 14 years
U.S. Cl. D6—397



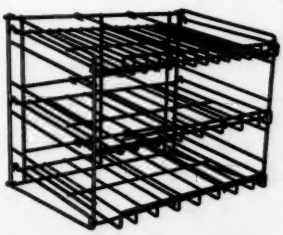
321,607
COMPACT DISC HOLDER
Chow Y. Sheung, Kowloon, Hong Kong, assignor to Sun Hing Audio Equipment Manufactory Limited, Kowloon, Hong Kong
Filed Feb. 28, 1989, Ser. No. 318,197
Claims priority, application United Kingdom, Aug. 31, 1988, 1053334
Term of patent 14 years
U.S. Cl. D6—407



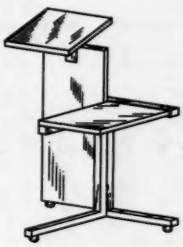
321,608
STORAGE RACK
James E. Hay, 21080 Oriole La., Bend, Oreg. 97701
Filed Jul. 20, 1989, Ser. No. 383,348
Term of patent 14 years
U.S. Cl. D6—407



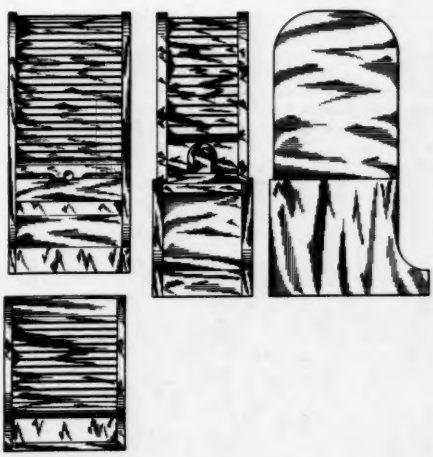
321,609
WIRE SHELVING UNIT FOR CANNED GOODS
Shahriar Dardashti, 141 N. Clark Dr., Ste. 2, Los Angeles, Calif. 90048
Filed Dec. 20, 1988, Ser. No. 286,778
Term of patent 14 years
U.S. Cl. D6—408



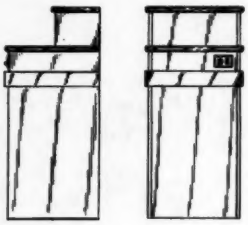
321,610
LECTERN
Robert L. Rienecker, 2633 Martinez Dr., Burlingame, Calif. 94010
Filed Nov. 21, 1988, Ser. No. 274,300
Term of patent 14 years
U.S. Cl. D6—419



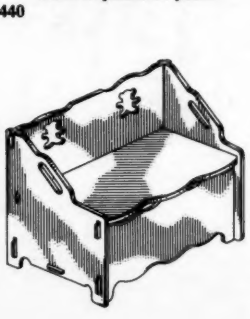
321,611
CABINET FOR A BEVERAGE DISPENSER
Lawrence A. Melberg, 428 N. Lake St., Neenah, Wis. 54956
Filed Dec. 13, 1988, Ser. No. 283,942
Term of patent 14 years
U.S. Cl. D6—433



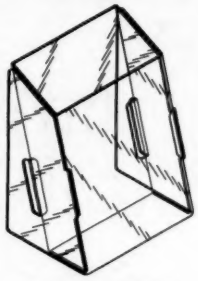
321,612
REFRESHMENT CENTER
Marty E. Sixt, Bellevue, Wash., assignor to Pure-Best Water, Inc., West Sacramento, Calif.
Filed May 1, 1989, Ser. No. 346,394
Term of patent 14 years
U.S. Cl. D6—438



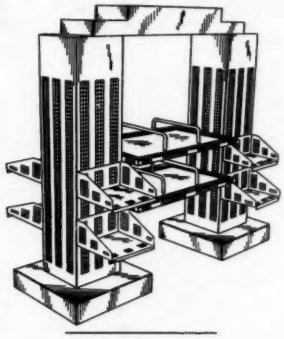
321,613
CHEST OR THE LIKE
Paul J. Gandy, Tucson, Ariz., assignor to Marana Unique Products Inc., Tucson, Ariz.
Filed May 8, 1989, Ser. No. 349,332
Term of patent 14 years
U.S. Cl. D6—440



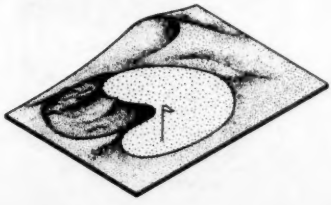
321,614
DISPLAY HOLDER FOR BROCHURES AND THE LIKE
Richard M. Liptak, Parma Heights, Ohio, assignor to Integral Design, Inc., Cleveland, Ohio
Filed Jun. 22, 1989, Ser. No. 369,912
Term of patent 14 years
U.S. Cl. D6—475



321,615
DISPLAY STAND
Marcia F. Lavine, Cold Spring, Minn., and Michael E. Jekot, Prairie Village, Kans., assignors to M. Lavine Design Workshop, Inc., Cold Spring, Minn. and The Lee Apparel Company, Inc., Merriam, Kans.
Filed Apr. 7, 1989, Ser. No. 334,992
Term of patent 14 years
U.S. Cl. D6—479

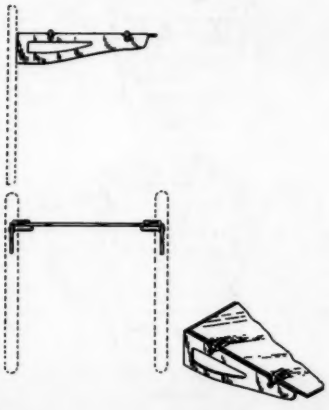


321,616
GOLFING GREEN INSERT FOR TABLE
Jesse Barfield, 4208 Canterwood Dr., Houston, Tex. 77068
Filed Aug. 17, 1989, Ser. No. 395,408
Term of patent 14 years
U.S. Cl. D6—491

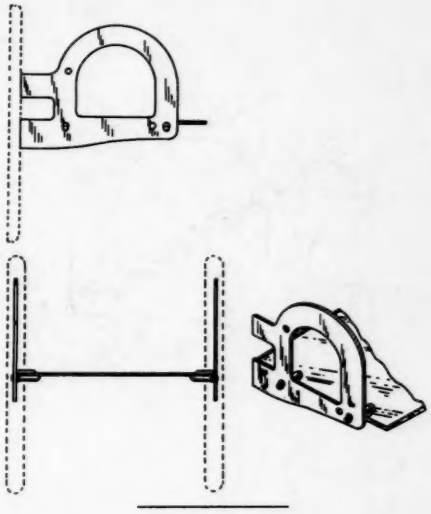


321,617
CHAIR ARM
Ronald B. Kemnitzer, Kansas City, Mo., assignor to Fixtures Manufacturing Corporation, Kanssas City, Mo.
Filed May 23, 1988, Ser. No. 197,398
Term of patent 14 years
U.S. Cl. D6—501

321,618
COMBINED BRACKET AND SHELF ASSEMBLY
William E. Stumpf, Minneapolis; Casey L. Carlson, Edina, both of Minn., and Richard S. Knape, Grand Rapids, Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed Jul. 14, 1989, Ser. No. 380,631
Term of patent 14 years
U.S. Cl. D6—574

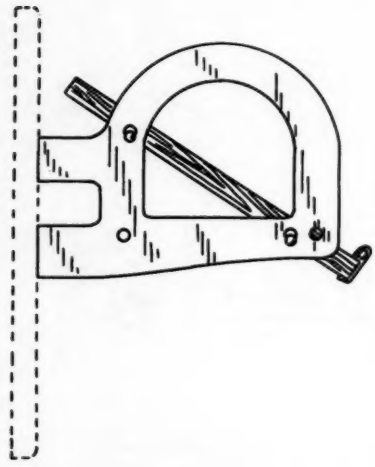


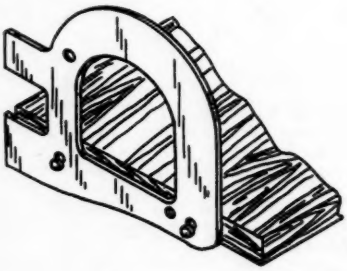
321,619
COMBINED BOOK END BRACKET AND SHELF ASSEMBLY
William E. Stumpf, Minneapolis; Casey L. Carlson, Edina, both of Minn., and Richard S. Knape, Grand Rapids, Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed Jul. 14, 1989, Ser. No. 380,646
Term of patent 14 years
U.S. Cl. D6—574

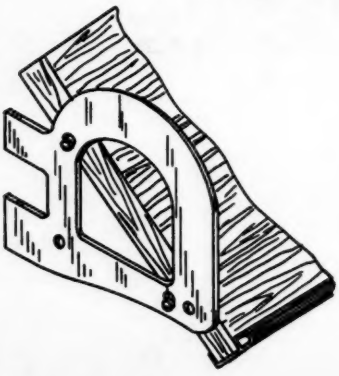


321,620
COMBINED BRACKET AND SHELF ASSEMBLY
William E. Stumpf, Minneapolis; Casey L. Carlson, Edina, both of Minn., and Richard S. Knape, Grand Rapids, Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed Jul. 14, 1989, Ser. No. 380,647
Term of patent 14 years
U.S. Cl. D6—574

321,621
COMBINED BOOK END BRACKET AND SHELF ASSEMBLY
William E. Stumpf, Minneapolis; Casey L. Carlson, Edina, both of Minn., and Ricahrd S. Knape, Grand Rapids, Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed Jul. 14, 1989, Ser. No. 380,648
Term of patent 14 years
U.S. Cl. D6—574

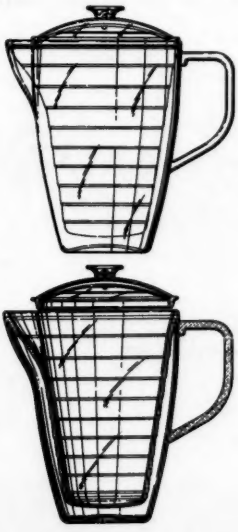






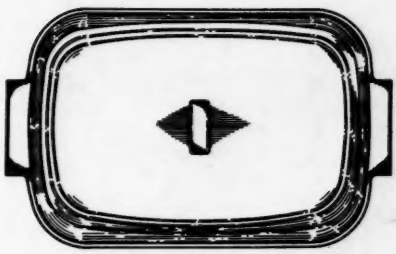
321,622
COMBINED BRACKET AND SHELF ASSEMBLY
William E. Stumpf, Minneapolis, and Casey L. Carlson, Edina, both of Minn., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.
Filed Jul. 14, 1989, Ser. No. 380,651
Term of patent 14 years
U.S. Cl. D6—574

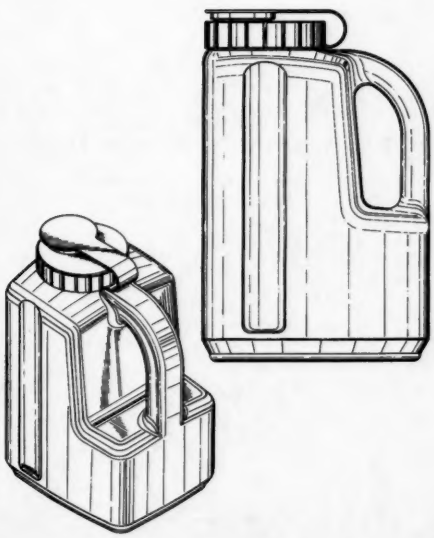
321,623
COVERED JUG
Cliff K. Sun, Kwung Tong, Hong Kong, assignor to Kin Hip Metal & Plastic Factory Limited, Kwun Tong, Hong Kong
Filed Dec. 6, 1988, Ser. No. 280,656
Claims priority, application United Kingdom, Nov. 2, 1988, 1054722
Term of patent 14 years
U.S. Cl. D7—317



321,624
PITCHER
Joseph F. Fiore, and John C. Weyer, Sr., both of Wooster, Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 12, 1989, Ser. No. 296,035
Term of patent 14 years
U.S. Cl. D7—321

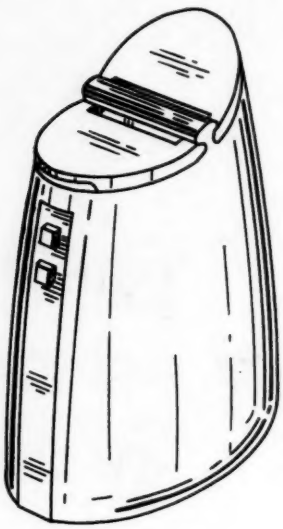
321,625
ELECTRIC SKILLET
William C. Dobson, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to The West Bend Company, West Bend, Wis.
Filed Nov. 14, 1988, Ser. No. 271,189
Term of patent 14 years
U.S. Cl. D7—360





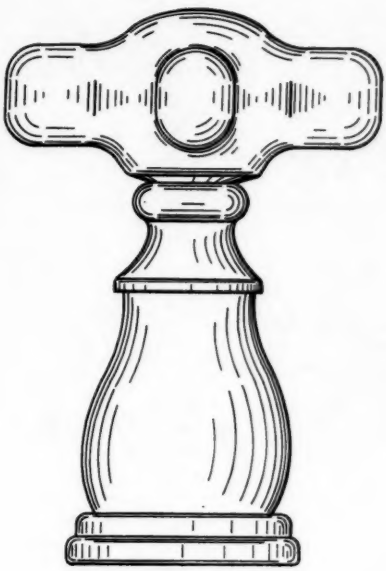
321,626
COMBINED CONTAINER WITH DISPENSING SPOUT AND STRAW
Larry L. Kouts, 1372 Lewisburg - Western Rd., Lewisburg, Ohio 45338
Filed Jun. 22, 1988, Ser. No. 210,128
Term of patent 14 years
U.S. Cl. D7—510

321,627
TWO SPICE DISPENSER
Harold Plough, 2000 W. Illinois Ave., Aurora, Ill. 60507
Filed Mar. 11, 1991, Ser. No. 668,405
Term of patent 14 years
U.S. Cl. D7—596



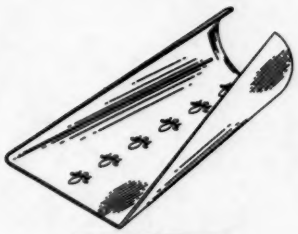
321,628
VACUUM BOTTLE
Ikuo Kobayashi, and Nobuyuki Kitamura, both of Kyoto, Japan, assignors to Japan Oxygen Co., Ltd., Japan
Filed Aug. 24, 1987, Ser. No. 88,969
Term of patent 14 years
U.S. Cl. D7—608

321,629
CONDIMENT MILL
Fred Hollinger, Kings Park, N.Y., assignor to Metrokane Inc., New York, N.Y.
Filed Nov. 13, 1989, Ser. No. 434,121
Term of patent 14 years
U.S. Cl. D7—679

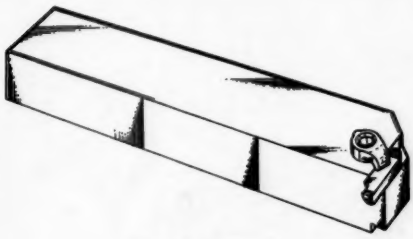


321,630
CONDIMENT MILL
Fred Hollinger, Kings Park, N.Y., assignor to Metrokane, Inc., New York, N.Y.
Filed Nov. 13, 1989, Ser. No. 434,975
Term of patent 14 years
U.S. Cl. D7—679

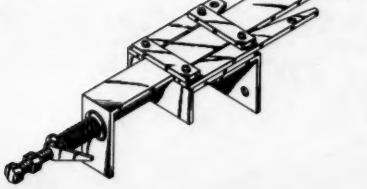
321,631
LEAF SCOOP
Elaine Shaw, 9345 Baird Rd., Shreveport, La. 71118
Filed May 4, 1990, Ser. No. 518,847
Term of patent 14 years
U.S. Cl. D8—10



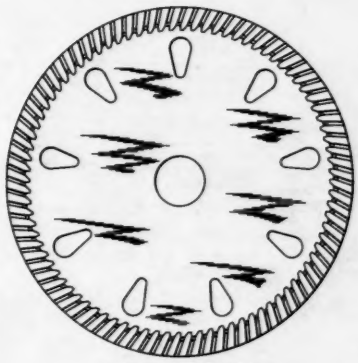
321,632
COMBINED CUTTING TOOL HOLDER AND CUTTING TIP
Wlajko Mihic, Tegnérvägen 9, Gävle, S-802 28, Sweden
Division of Ser. No. 888,189, Jul. 21, 1989, Pat. No. D. 311,747.
This application Jul. 9, 1990, Ser. No. 549,719
Claims priority, application Sweden, Jan. 29, 1986, 86-0221
Term of patent 14 years
U.S. Cl. D8—41



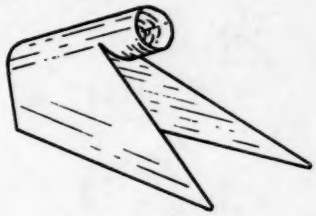
321,633
ANTI-BITE-OFF DEVICE FOR A WOOD MOULDER OR THE LIKE
Randall W. Rigney, P.O. Box 343, Rocky Mount, Va. 24151
Filed Oct. 18, 1988, Ser. No. 259,135
Term of patent 14 years
U.S. Cl. D8—70



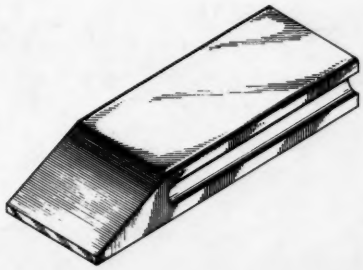
321,634
DIAMOND ABRASIVE SAW BLADE
Jiro Inoue, Ebina, Japan, assignor to Sankyo Diamond Industrial Co., Ltd., Japan
Filed Jan. 27, 1989, Ser. No. 303,383
Term of patent 14 years
U.S. Cl. D8—70



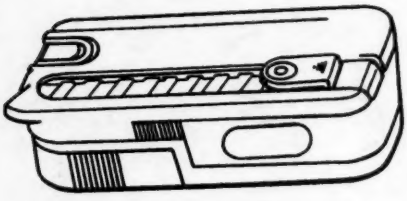
321,635
TOOL HOLDER
Daniel B. Kerrigan, 333 E. 6th & 84–11, Battle Mountain, Nev. 89820
Filed Nov. 14, 1988, Ser. No. 270,121
Term of patent 14 years
U.S. Cl. D8—71



321,636
TAMPING BLOCK
Henry Ciciliot, Box 270-A Lorraine Cir., R.D. #1, Allentown, Pa. 18104
Filed Feb. 6, 1989, Ser. No. 306,459
Term of patent 14 years
U.S. Cl. D8—75

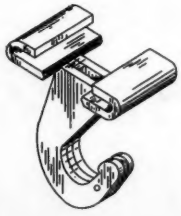


321,637
MULTIPURPOSE STATIONERY KIT
Kwong-Chi Chan, 8th Floor, Block B, Sun Kong Building, 2J-2Q Sai Yuen Choi Street, Hong Kong, Hong Kong
Filed Feb. 11, 1988, Ser. No. 155,009
Claims priority, application United Kingdom, Aug. 28, 1987, 1044486
Term of patent 14 years
U.S. Cl. D8—105

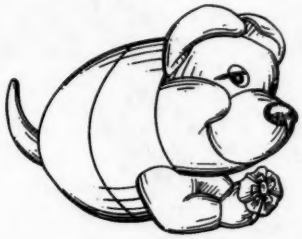


321,638
HANDLE
Herbert V. Kohler, Jr., Kohler, and Mary J. Reid, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1989, Ser. No. 297,915
Term of patent 14 years
U.S. Cl. D8—307

321,639
CEILING HOOK
William E. Adams, Box 1, Portersville, Pa. 16051
Filed Jan. 2, 1990, Ser. No. 459,580
Term of patent 14 years
U.S. Cl. D8—373



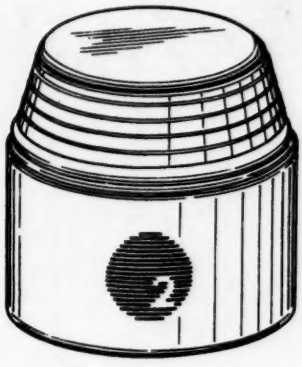
321,640
CONTAINER FOR CONFECTIONERY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero Ardennes S.A., Arlon, Belgium
Filed Feb. 12, 1990, Ser. No. 479,548
Claims priority, application Italy, Sep. 29, 1989, 53387-B/89
Term of patent 14 years
U.S. Cl. D9—318



321,641
CONTAINER FOR CONFECTIONERY PRODUCTS
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero Ardennes S.A., Arlon, Belgium
Filed Feb. 13, 1990, Ser. No. 479,554
Claims priority, application Italy, Sep. 29, 1989, 53387-B/89
Term of patent 14 years
U.S. Cl. D9—318

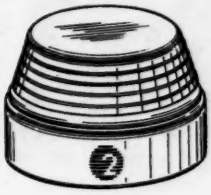
321,642
SIMULATIVE BOTTLE
Marco Messeni-Petruzzelli, Santo Spirito, Italy, assignor to Marconix Azienda Agricola del Feudo, Bari, Italy
Filed Jul. 25, 1989, Ser. No. 384,524
Claims priority, application Italy, Jan. 27, 1989, 52842/89[U]
Term of patent 14 years
U.S. Cl. D9—329

321,643
COSMETIC CONTAINER
Hirofumi Katada, and Hiroyuki Matsuyama, both of Tokyo, Japan, assignors to Pola Chemical Industries, Inc., Shizuoka, Japan
Filed Nov. 20, 1989, Ser. No. 437,995
Claims priority, application Japan, Jun. 30, 1989, 1-24176
The portion of the term of this patent subsequent to Nov. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—333

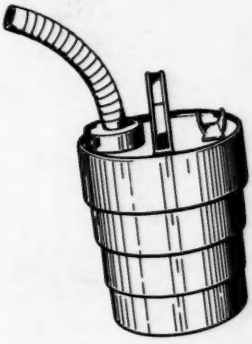


321,644
COSMETIC CONTAINER
Hirofumi Katada, and Hiroyuki Matsuyama, both of Tokyo, Japan, assignors to Pola Chemical Industries Inc., Shizuoka, Japan
Filed Nov. 20, 1989, Ser. No. 437,996
Claims priority, application Japan, Jun. 30, 1989, 1-24175
The portion of the term of this patent subsequent to Nov. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—333

321,645
COSMETIC CONTAINER
Hirofumi Katada, and Hiroyuki Matsuyama, both of Tokyo, Japan, assignors to Pola Chemical Industries Inc., Shizuoka, Japan
Filed Nov. 20, 1989, Ser. No. 437,997
Claims priority, application Japan, Jun. 30, 1989, 1-24177
The portion of the term of this patent subsequent to Nov. 19, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—333

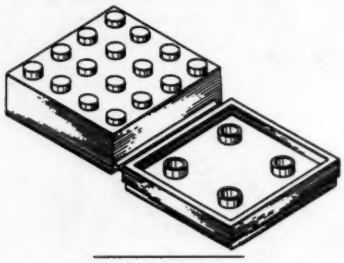


321,646
CONTAINER
Gerald J. Robertson, 510 Avenida Presidio, Walnut, Calif. 91789
Filed May 9, 1988, Ser. No. 191,493
Term of patent 14 years
U.S. Cl. D9—337



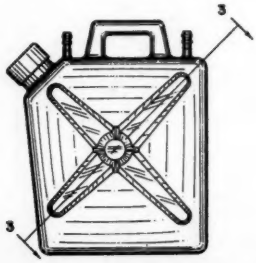
321,647
SUPPLY BOX FOR GRAVITY FED DISPLAY
Dennis Oldorf, 8178 Round Hills Cir., Las Vegas, Nev. 89113
Filed Dec. 13, 1989, Ser. No. 450,123
Term of patent 14 years
U.S. Cl. D9—339

321,648
CONTAINER
Vero Ricci, 106 E. Stiles Ave., Collingswood, N.J. 08108
Filed Jul. 10, 1989, Ser. No. 377,456
Term of patent 14 years
U.S. Cl. D9—341

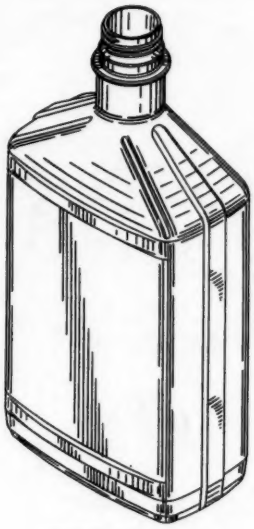


321,649
COMBINED CONTAINER AND CAP
James J. Lambe, Jr.; Margery M. Lambe, both of 616 Lakeview Cir. SE., Rio Rancho, N. Mex. 87124, and
Filed Nov. 8, 1988, Ser. No. 268,528
Term of patent 14 years
U.S. Cl. D9—353

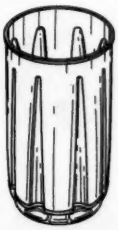
321,650
COMBINED BOTTLE AND CAP OR SIMILAR ARTICLE
Paul A. Braginetz, 214 Oak Ridge Cir., Staunton, Va. 24401
Filed Oct. 24, 1989, Ser. No. 426,000
Term of patent 14 years
U.S. Cl. D9—374



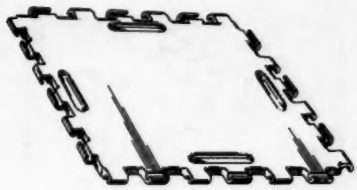
321,651
PLASTIC OIL BOTTLE
Donald D. Cochran, Bartlett, Ill., assignor to American National Can Company, Chicago, Ill.
Filed Jan. 23, 1989, Ser. No. 300,354
Term of patent 14 years
U.S. Cl. D9—403

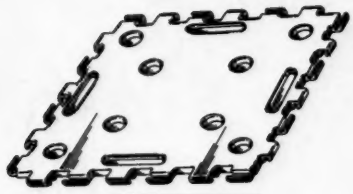


321,652
STACKABLE CONTAINER
Stephen P. Palisin, Jr., South Euclid, Ohio, assignor to Berwick Manufacturing, Inc., Cleveland, Ohio
Filed Nov. 14, 1988, Ser. No. 270,123
The portion of the term of this patent subsequent to Oct. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—429

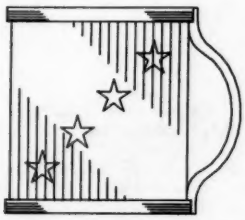


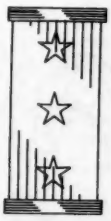
321,653
CONTAINER PANEL
Benno Elgner, King City, Canada, assignor to ABC Group Product Development, Brampton, Canada
Filed Sep. 13, 1989, Ser. No. 406,509
Claims priority, application Canada, Jun. 19, 1989, 1906897
Term of patent 14 years
U.S. Cl. D9—434



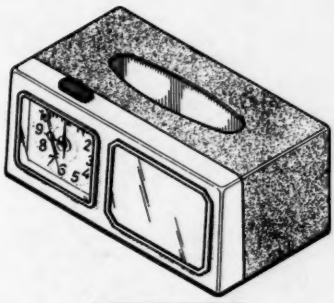


321,654
BOX DRINK HOLDER
Michael J. White, 1465 Bobo Rd., Dallas, Ga. 30132
Filed Dec. 7, 1989, Ser. No. 447,087
Term of patent 14 years
U.S. Cl. D7—622

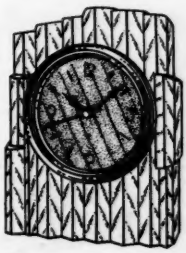




321,655
COMBINED ALARM CLOCK, TISSUE CASE, AND PHOTO FRAME
Chuan K. Lai, No. 3, Lane 133, Sec. 1, Chungshan Rd., Tou Chia Village, Tan Tzu Hsiang, Taichung Hsien, Taiwan
Filed Nov. 25, 1988, Ser. No. 275,794
Term of patent 14 years
U.S. Cl. D10—2

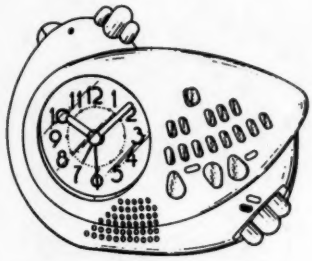


321,656
CLOCK
Masahiro Aikawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 11, 1989, Ser. No. 405,670
Term of patent 14 years
U.S. Cl. D10—6

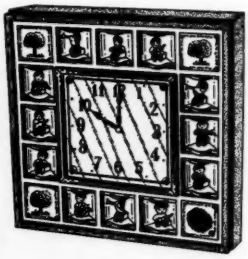


321,657
CLOCK
Keiko Nomura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 9, 1989, Ser. No. 364,187
Term of patent 14 years
U.S. Cl. D10—7

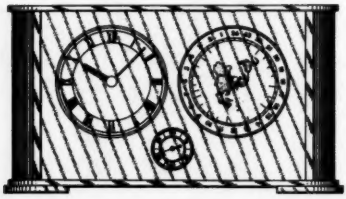
321,658
CLOCK
Koji Ohmaki, Tokyo, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan
Filed Jun. 29, 1989, Ser. No. 374,643
Claims priority, application Japan, Jan. 17, 1989, 1-1301
Term of patent 14 years
U.S. Cl. D10—7



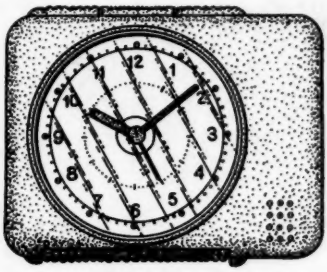
321,659
CLOCK
Keiko Nomura, and Mariko Minami, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan
Filed Sep. 29, 1989, Ser. No. 415,115
Term of patent 14 years
U.S. Cl. D10—8

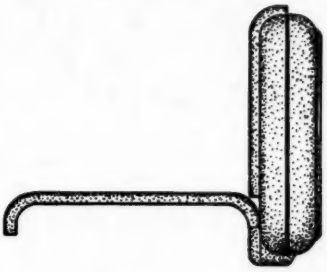


321,660
CLOCK
Masahiro Aikawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Apr. 24, 1989, Ser. No. 342,390
Claims priority, application Japan, Nov. 28, 1988, 63-46351
Term of patent 14 years
U.S. Cl. D10—10



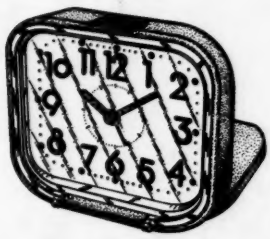
321,661
CLOCK
Katsumi Shimamura, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed May 5, 1989, Ser. No. 348,024
Claims priority, application Japan, Dec. 2, 1988, 63-47144
Term of patent 14 years
U.S. Cl. D10—18



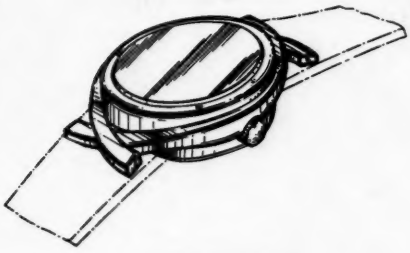


321,662
TRAVEL ALARM CLOCK
Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 5, 1989, Ser. No. 361,096
Claims priority, application Japan, Dec. 6, 1988, 63-47593
Term of patent 14 years
U.S. Cl. D10—18

321,663
TRAVEL ALARM CLOCK
Mamoru Tanaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 3, 1989, Ser. No. 389,106
Claims priority, application Japan, Apr. 6, 1989, 1-12752
Term of patent 14 years
U.S. Cl. D10—18



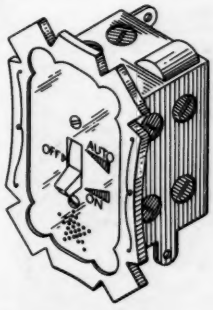
321,664
WATCH CASE AND ATTACHMENT
Mary A. Kennedy, Brewster, N.Y., assignor to Timex Corporation, Waterbury, Conn.
Filed May 1, 1989, Ser. No. 346,091
Term of patent 14 years
U.S. Cl. D10—30



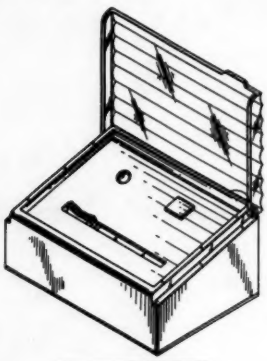
321,665
WRISTWATCH AND STRAP
Carlo Crocco, Lugano, Switzerland, assignor to Montres Mom Fabrication S.A., Nyon, Switzerland
Filed Jun. 22, 1988, Ser. No. 210,010
Claims priority, application Int'l Pat. Institute, Dec. 23, 1987, DM/009921
Term of patent 14 years
U.S. Cl. D10—32

321,666
WRISTWATCH AND STRAP
Eddy Burgener, Moutier, Switzerland, assignor to Roventa-Henex SA, Bienne, Switzerland
Filed Jul. 13, 1988, Ser. No. 218,067
Claims priority, application World Int. Prop. O., Jan. 19, 1988, DM/010096
Term of patent 14 years
U.S. Cl. D10—32

321,667
LIGHT TIMER
Thomas G. Baker, Jr., 1519 - 78th St., University City, Mo. 63130
Filed Jun. 21, 1989, Ser. No. 369,275
Term of patent 14 years
U.S. Cl. D10—40

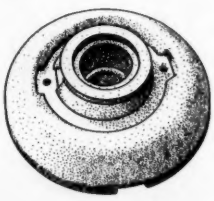


321,668
ELECTRICAL TIMER
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Feb. 27, 1991, Ser. No. 655,131
Term of patent 14 years
U.S. Cl. D10—40



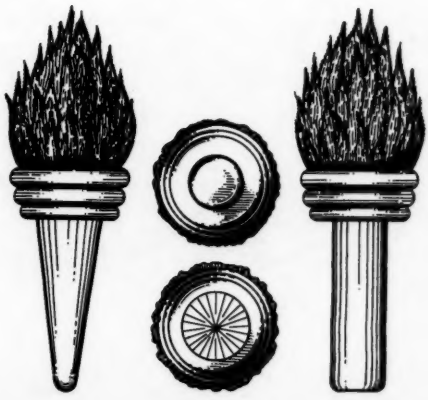
321,669
HOURGLASS TIMER
George Hoehne, Crescent Beach Rd., Glen Cove, N.Y. 11542
Filed Nov. 14, 1988, Ser. No. 271,063
Term of patent 14 years
U.S. Cl. D10—44

321,670
CHRISTMAS TREE STAND
Carman Buonito, Scarbourgh, and Donald Shaw, Willowdale, both of Canada, assignors to Integrated Plastics Limited, Agincourt, Canada
Filed Dec. 28, 1989, Ser. No. 458,533
Claims priority, application Canada, Jun. 28, 1989, 28-06-89-1
Term of patent 14 years
U.S. Cl. D11—130.1

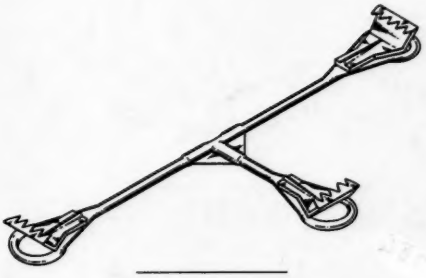


321,671
CHRISTMAS ORNAMENT
Richard F. Goonen, 2522 Eckman Pl., Apt. F-2, Lafayette, Ind. 10910
Filed Nov. 21, 1988, Ser. No. 274,788
Term of patent 14 years
U.S. Cl. D11—117

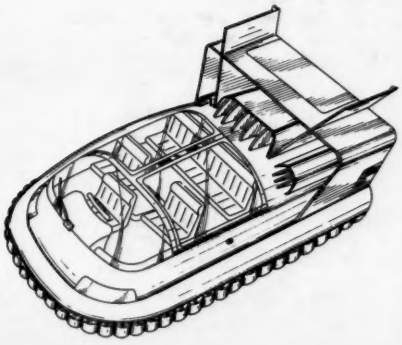
321,672
NOVELTY TORCH
Sandra L. Armstrong, 5814 S. Cheyenne St., Tacoma, Wash. 98409
Filed Dec. 18, 1989, Ser. No. 451,547
Term of patent 14 years
U.S. Cl. D11—157



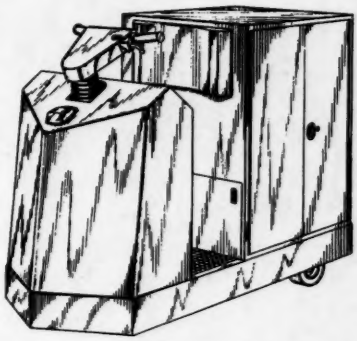
321,673
DIAPER FASTENER
Japie Crafford, Pretoria, South Africa, assignor to Snappi Holdings (Proprietary) Limited, Pretoria, South Africa
Filed Mar. 14, 1989, Ser. No. 323,548
Claims priority, application South Africa, Sep. 14, 1988, 88/0968
The portion of the term of this patent subsequent to Sep. 19, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—200



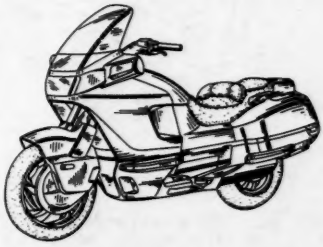
321,674
HOVERCRAFT
Peter Chia, Chia Enterprises, Suite #111, #2 Levandale Road, Richmond Hill, Ontario L4C 4H2, Canada
Filed Aug. 18, 1989, Ser. No. 395,951
Term of patent 14 years
U.S. Cl. D12—5

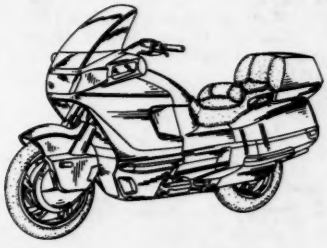


321,675
VEHICLE
Arunas P. Oslapas, Holland, Mich., assignor to JWI, Inc., Holland, Mich.
Filed Jun. 16, 1989, Ser. No. 367,216
Term of patent 14 years
U.S. Cl. D12—85

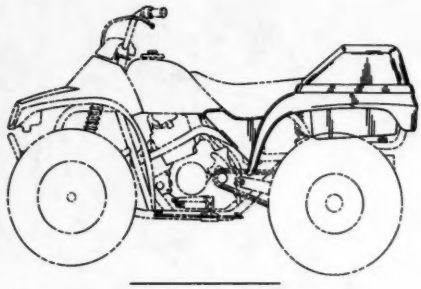


321,676
MOTORCYCLE
Makoto Kitagawa, Shiki; Toshio Kurihara, Tokorozawa, and Elizi Ozawa, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 13, 1989, Ser. No. 322,822
Claims priority, application Japan, Sep. 13, 1988, 63-36166; Dec. 28, 1988, 63-51560
Term of patent 14 years
U.S. Cl. D12—110



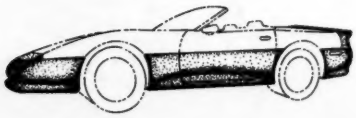


321,677
FENDER RECEPTACLE UNIT FOR A FOUR WHEEL VEHICLE
Kazuhiko Saito, Rancho Palos Verdes, and Yutaka Kawasaki, Redondo Beach, both of Calif., assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 12, 1989, Ser. No. 337,124
Term of patent 14 years
U.S. Cl. D12—117

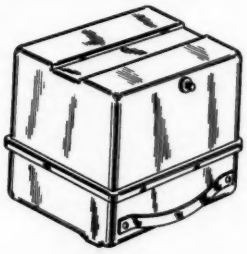


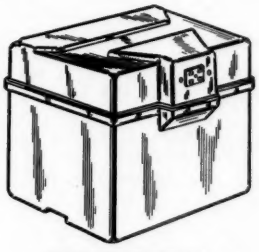
321,678
POWERED INVALID VEHICLE
Wendell G. Blount, P.O. Box 1032, Calhoun City, Miss. 38916; Ronald J. Mosetich, Rte. II, Box 35, Koscinsko, Miss. 39090, and Bedford F. Peeples, 1609 Deering St., Cleveland, Miss. 38732
Filed Feb. 22, 1990, Ser. No. 483,005
Term of patent 14 years
U.S. Cl. D12—131

321,679
EXTERIOR BODY PANEL KIT FOR ATTACHMENT TO AN AUTOMOBILE BODY
Lawrence K. Shinoda, West Bloomfield, Mich., assignor to Shinoda-Williams Design, Inc., Pasadena, Calif.
Filed Dec. 20, 1989, Ser. No. 453,468
Term of patent 14 years
U.S. Cl. D12—196

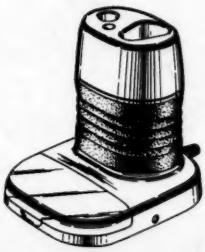


321,680
BATTERY CASE
Wendell G. Blount, P.O. Box 1032, Madison at Randolph St.; Henry L. Lackey, P.O. Drawer "T", both of Calhoun City, Miss. 38916; Ronald J. Mosetich, Rte, II Box 35, Kosciusko, Miss. 39090; Bedford F. Peeples, 1609 Derring St., Cleveland, Miss. 38732; David L. Kimbro, 138 Gregory St., Calhoun City, Miss. 38916; William J. Saunders, 6011 Patillo Way, Lithonia, Ga. 30058; Lloyd M. Yardley, 1222 Timberglen Ct., Lilburn, Ga. 30247; J. Douglas Alsup, 3302 Creekside Ct., Convers, Ga. 30208, and Samuel C. Crosby, 1367 Red Fox Run, Lilburn, Ga. 30247
Filed Mar. 13, 1989, Ser. No. 322,232
Term of patent 14 years
U.S. Cl. D13—103

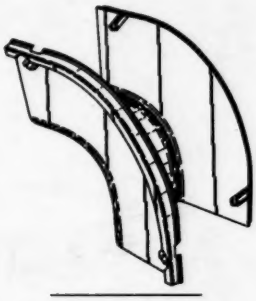




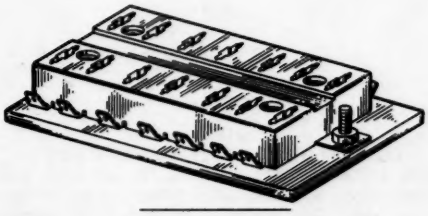
321,681
BATTERY CHARGER FOR ELECTRIC ERASER
Keiichi Ohashi, Shizuoka, Japan, assignor to Skylite Industry Co., Ltd., Shizuoka, Japan
Filed Dec. 19, 1989, Ser. No. 452,330
Term of patent 14 years
U.S. Cl. D13—108



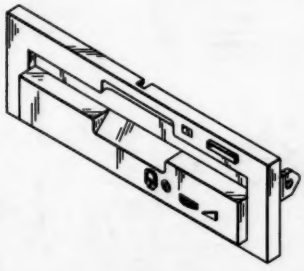
321,682
GUIDING THROUGH, 90 DEGREE DOWN ELBOW FOR OPTICAL FIBERS
Roy Henneberger, 1596 Clemson Dr., Eagan, Minn. 55122
Filed Jul. 31, 1989, Ser. No. 387,637
Term of patent 14 years
U.S. Cl. D13—155



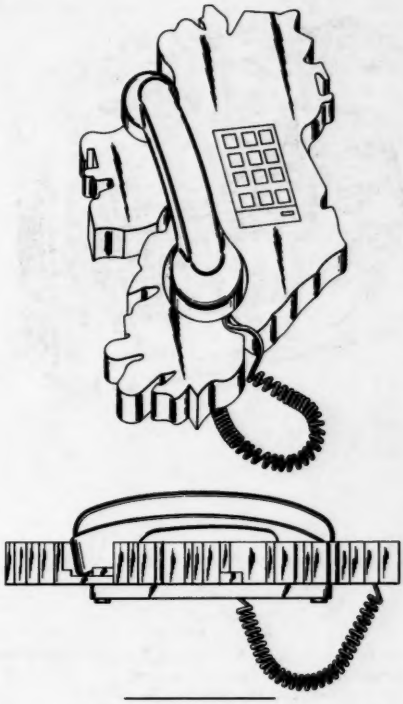
321,683
BLADE-TYPE FUSE BLOCK
David R. Marach, Marengo, Ill., assignor to Cooper Industries, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 232,322, Aug. 15, 1988, Pat. No. 4,872,262. This application Jul. 10, 1989, Ser. No. 377,866
Term of patent 14 years
U.S. Cl. D13—173



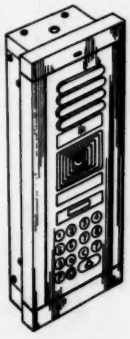
321,684
FRONT PANEL FOR OPTICAL DRIVE
Jeffrey L. Kline, and Tristan A. Merino, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 29, 1990, Ser. No. 471,982
Term of patent 14 years
U.S. Cl. D14—115



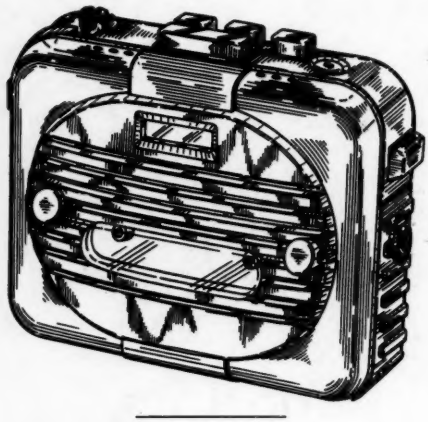
321,685
TELEPHONE SET
Andrew W. Bradley, Dublin, Ireland, assignor to Northern Telecom (Dublin) Limited, Dublin, Ireland
Filed Jan. 19, 1990, Ser. No. 477,348
Claims priority, application Iran, Jul. 20, 1989, 280/89
Term of patent 14 years
U.S. Cl. D14—143



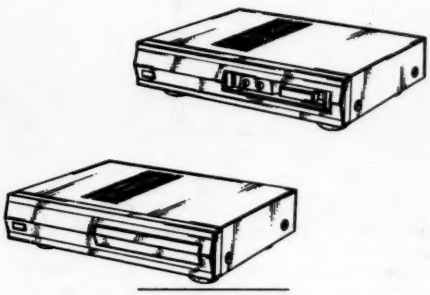
321,686
INTERCOMMUNICATIONS UNIT
Lisio Plozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Italy
Filed Oct. 10, 1989, Ser. No. 419,856
Claims priority, application Italy, Apr. 7, 1989, 53004/89[U]
Term of patent 14 years
U.S. Cl. D14—159



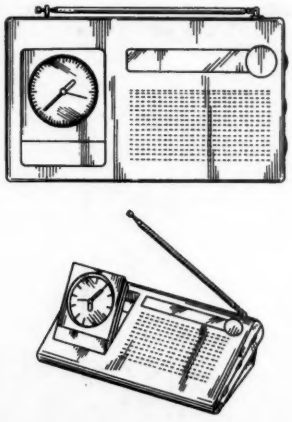
321,687
CASSETTE TAPE PLAYER
Hiroyuki Miyai, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 21, 1989, Ser. No. 396,465
Claims priority, application Japan, Feb. 20, 1989, 1-6158
Term of patent 14 years
U.S. Cl. D14—165



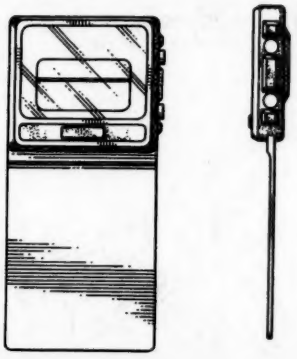
321,689
AUDIO AMPLIFIER
Yoshiro Yamakawa, Tokyo, Japan, assignor to Yamaha Corporation, Shizuoka, Japan
Filed Jun. 1, 1989, Ser. No. 360,707
Claims priority, application Japan, Dec. 3, 1988, 63-47350
Term of patent 14 years
U.S. Cl. D14—188



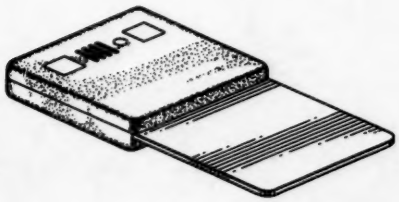
321,688
CLOCK RADIO
William To Yung Pang, Kowloon, Hong Kong, assignor to Saple International Ltd., Kowloon, Hong Kong
Filed Aug. 14, 1989, Ser. No. 393,509
Claims priority, application United Kingdom, May 24, 1989, 1059701
Term of patent 14 years
U.S. Cl. D14—170

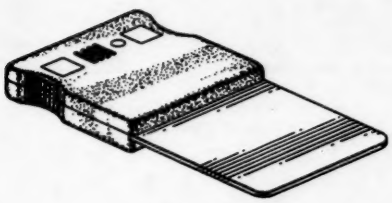


321,690
COMBINED PAGER AND MAGNETIC KEY
Beverly J. Brenda, 25021 Acacia La., Laguna Hills, Calif. 92653; Hassin A. Abiney, 18233 Muirwoods Ct., Fountain Valley, Calif. 92708, and Roger McDiarmid, 8531 Meadow Brook Ave., #204, Garden Grove, Calif. 92704
Filed Mar. 1, 1990, Ser. No. 487,175
Term of patent 14 years
U.S. Cl. D14—191

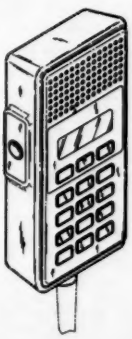


321,691
COMBINED PAGER AND MAGNETIC KEY
Beverly J. Brenda, 25021 Acacia La., Laguna Hills, Calif. 92653; Hassin A. Abiney, 18233 Muirwoods Ct., Fountain Valley, Calif. 92708, and Roger McDiarmid, 8531 Meadow Brook Ave., #204, Garden Grove, Calif. 92704
Filed Mar. 1, 1990, Ser. No. 487,176
Term of patent 14 years
U.S. Cl. D14—191

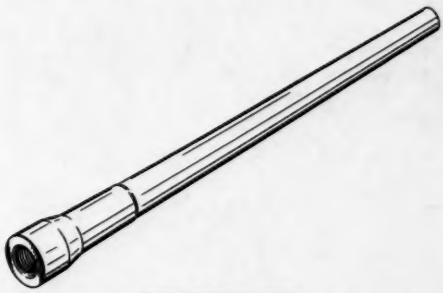




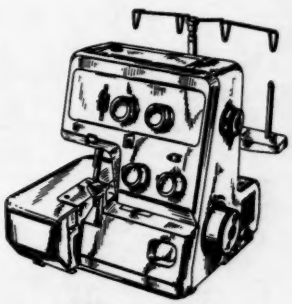
321,692
COMBINED MICROPHONE AND RADIO CONTROL UNIT OR SIMILAR ARTICLE
Craig F. Siddoway, Davie; Scott H. Richards, Sunrise, and Bruce A. Claxton, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 28, 1989, Ser. No. 415,148
Term of patent 14 years
U.S. Cl. D14—226



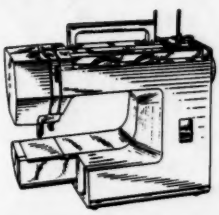
321,693
ANTENNA STUB
Peter Mailandt, Dallas, Tex., assignor to Alliance Telecommunications Corp., Dallas, Tex.
Filed Mar. 13, 1989, Ser. No. 322,228
Term of patent 14 years
U.S. Cl. D14—234



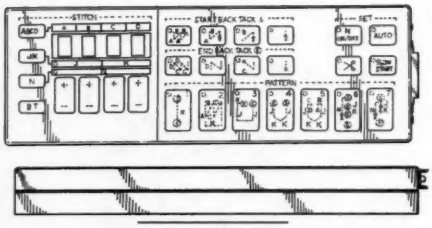
321,694
SEWING MACHINE
Koji Uchida, Tokyo, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Aug. 10, 1989, Ser. No. 392,132
Claims priority, application Japan, Jun. 28, 1989, 1-23672
Term of patent 14 years
U.S. Cl. D15—69



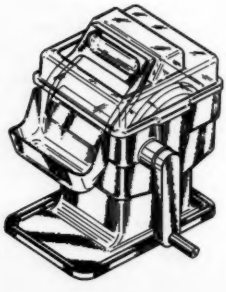
321,695
SEWING MACHINE
Nobufusa Kuroki, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Mar. 17, 1989, Ser. No. 325,354
Claims priority, application Japan, Sep. 22, 1988, 63-37052
Term of patent 14 years
U.S. Cl. D15—70



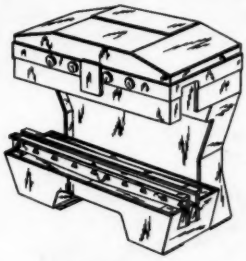
321,696
CONTROLLER FOR A SEWING MACHINE
Hiroshi Kumatani; Satomi Yamauchi, both of Nagoya, and Takanobu Fujimoto, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1989, Ser. No. 436,172
Claims priority, application Japan, May 15, 1989, 1-17589
Term of patent 14 years
U.S. Cl. D15—72



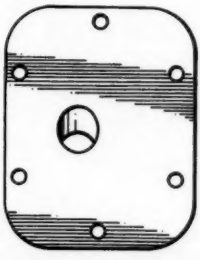
321,697
ICE CREAM MAKER
Lawrence A. Blaustein, Moreland Hills, and Patrick W. Brown, North Olmsted, both of Ohio, assignors to Tyco Industries, Inc., Mt. Laurel, N.J.
Filed Jun. 20, 1989, Ser. No. 369,548
Term of patent 14 years
U.S. Cl. D15—82



321,698
BASE FOR ROTARY ARC RAM
John F. Riera, 3689 Sandburg Dr., Troy, Mich. 48084; Billy J. Bielawski, Sr., 2270 Flanders Dr., Rochester Hills, and John J. Pavelec, 413 Dalton, Rochester, both of Mich. 48063
Filed Oct. 24, 1988, Ser. No. 263,558
Term of patent 14 years
U.S. Cl. D15—141



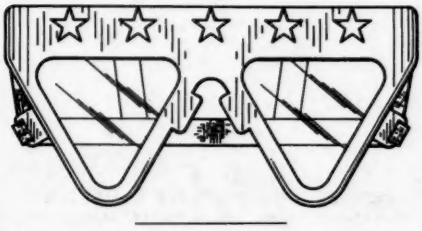
321,699
ADAPTOR FOR AN AUXILIARY TRANSMISSION
Clayton D. Macomber, 9514—164th St. NE., Arlington, Wash. 98223
Filed Nov. 1, 1988, Ser. No. 265,462
Term of patent 14 years
U.S. Cl. D15—149



321,700
NOVELTY EYEGLASSES
Theodore A. Smith, 1420 Hepburn Ave., Louisville, Ky. 40204
Filed Apr. 25, 1990, Ser. No. 514,356
Term of patent 14 years
U.S. Cl. D16—104

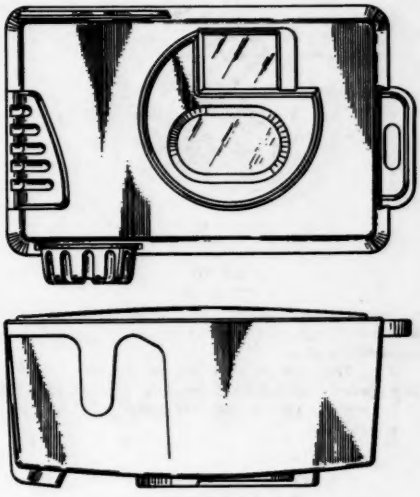
321,701
LIQUID CRYSTAL SUNGLASSES
Yasuhiro Nomura, and Koichi Takahashi, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 20, 1989, Ser. No. 438,366
Claims priority, application Japan, May 22, 1989, 018578/89
Term of patent 14 years
U.S. Cl. D16—102

321,702
SUNGLASSES FOR AN INFANT
Gary M. Jennings, 127 N. Locust #5, Ripon, Calif. 95366
Filed Dec. 1, 1988, Ser. No. 278,424
Term of patent 14 years
U.S. Cl. D16—107

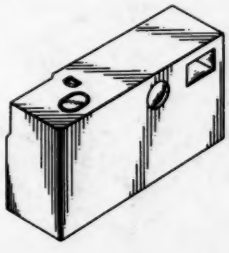


321,703
SUNGLASSES
Werner E. Grau, Friedberg-Haberskirch, Fed. Rep. of Germany, assignor to Uvex Winter Optical, Inc., Smithfield, R.I.
Filed Dec. 1, 1989, Ser. No. 445,981
Term of patent 14 years
U.S. Cl. D16—112

321,704
ALL-WEATHER CAMERA
Bruce A. Leonard, Honeoye Falls; Ralph M. Lyon, and Jerry L. Hargrave, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 14, 1989, Ser. No. 339,412
Term of patent 14 years
U.S. Cl. D16—200

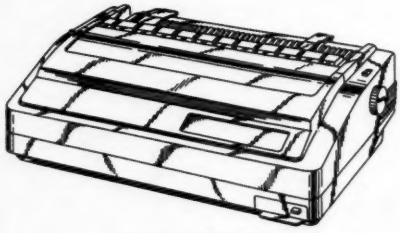


321,705
DISPOSABLE CAMERA
Hiroshi Ohmura, and Takuya Arai, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 28, 1989, Ser. No. 316,929
Claims priority, application Japan, Aug. 31, 1988, 63-34474; Aug. 31, 1988, 63-34476; Aug. 31, 1988, 63-34477; Aug. 31, 1988, 63-34480
Term of patent 14 years
U.S. Cl. D16—208

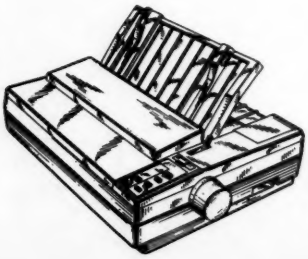


321,706
CASH REGISTER FOR POINT OF SALES SYSTEM
Yoshiro Yamamoto, Funabashi, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan
Filed Jan. 2, 1990, Ser. No. 459,571
Claims priority, application Japan, Jun. 30, 1989, 1-24200
Term of patent 14 years
U.S. Cl. D18—4

321,707
PRINTER
Toru Irie; Yoshinori Kakiuchi, both of Kawasaki, and Akira Tsukamoto, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Apr. 14, 1989, Ser. No. 338,126
Claims priority, application Japan, Oct. 14, 1988, 63-40425
Term of patent 14 years
U.S. Cl. D18—54



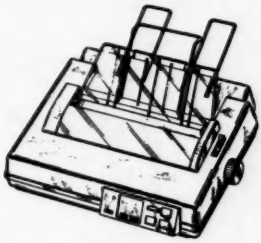
321,708
PRINTER FOR ELECTRONIC COMPUTER
Noritaka Uchibori, and Toshimutsu Ohara, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Apr. 17, 1989, Ser. No. 339,430
Claims priority, application Japan, Oct. 28, 1988, 42437/88
Term of patent 14 years
U.S. Cl. D18—54



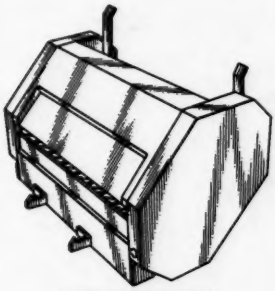
321,709
PRINTER FOR ELECTRONIC COMPUTER
Noritaka Uchibori, and Michiyo Ichikawa, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed May 18, 1989, Ser. No. 353,734
Claims priority, application Japan, Nov. 26, 1988, 46114/88
Term of patent 14 years
U.S. Cl. D18—54

321,710
PRINTER FOR ELECTRONIC COMPUTER
Noritaka Uchibori; Hitoshi Igarashi, both of Nagano, Japan, and Mitsuru Iseki, Aichi, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Jul. 19, 1989, Ser. No. 382,811
Claims priority, application Japan, Feb. 10, 1989, 5060/89
Term of patent 14 years
U.S. Cl. D18—54

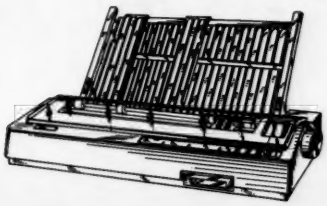
321,711
PRINTER
Tsutomu Yoshihara, Ayase, and Shigeru Nezu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 14, 1989, Ser. No. 393,321
Claims priority, application Japan, Feb. 16, 1989, 1-5914
Term of patent 14 years
U.S. Cl. D18—54



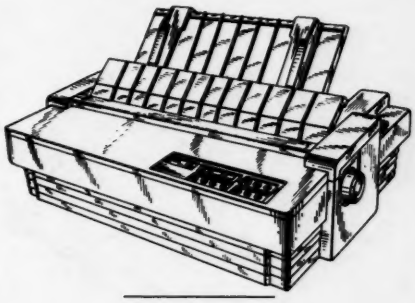
321,712
SHEET FEEDER
Eiji Tsutsui, Hyogo, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan
Filed Aug. 28, 1989, Ser. No. 400,233
Claims priority, application Japan, Mar. 7, 1989, 1-8252
Term of patent 14 years
U.S. Cl. D18—49



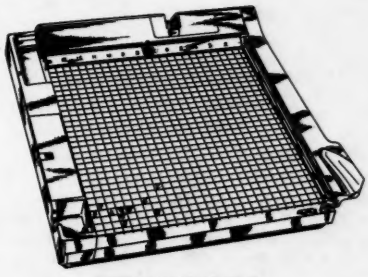
321,713
PRINTER FOR A COMPUTER
Akihiko Matsuo; Akio Takeda, and Kiyoshi Fujii, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed Feb. 16, 1989, Ser. No. 311,681
Claims priority, application Japan, Sep. 2, 1988, 63-34798
Term of patent 14 years
U.S. Cl. D18—54



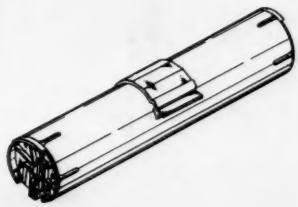
321,714
PRINTER FOR ELECTRONIC COMPUTER
Friedrich F. Frenkler, Tokyo; Masayuki Ono, Nagano; Akira Suzuki, Nagano, and Noritaka Uchibori, Nagano, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed May 15, 1989, Ser. No. 352,216
Claims priority, application Japan, Nov. 14, 1988, 63-44477
Term of patent 14 years
U.S. Cl. D18—54



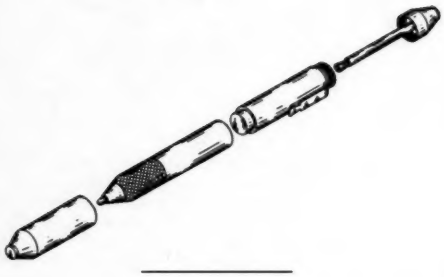
321,715
COMBINED PAPER TRIMMER AND DISPENSER WITH STORAGE FOR OFFICE SUPPLIES
Steven J. Beno, and Joseph R. Mango, both of c/o Ideal School Supply Corporation, 2245 Delany Rd., Waukegan, Ill. 60087
Filed Mar. 22, 1989, Ser. No. 327,155
Term of patent 14 years
U.S. Cl. D18—34



321,716
TONER CARTRIDGE
Hiroshi Kikuchi; Hisao Ono; Yoshiharu Momiyama, and Shigeki Nakajima, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Nov. 13, 1989, Ser. No. 433,831
Claims priority, application Japan, Sep. 6, 1989, 1-32357
Term of patent 14 years
U.S. Cl. D18—43



321,717
COMBINED BALL-POINT PEN AND CORRECTION FLUID APPLICATOR
Larry L. Hager, 14027 35th Ave., South, Seattle, Wash. 98168
Filed Mar. 27, 1989, Ser. No. 328,607
Term of patent 14 years
U.S. Cl. D19—36



321,718
BALL POINT PEN WITH RETRACTABLE CAP
Emilio Ambasz, 295 Central Park West, New York, N.Y. 10024
Filed Jan. 5, 1989, Ser. No. 293,871
Term of patent 14 years
U.S. Cl. D19—48

321,719
FELT TIP PEN
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan
Filed Apr. 25, 1989, Ser. No. 344,143
Claims priority, application Japan, Oct. 17, 1988, 63-40312
Term of patent 14 years
U.S. Cl. D19—48

321,720
BALL-POINT PEN
Hidemi Sakurada, Setagaya, Japan, assignor to Nikko Pen Co., Ltd., Japan
Filed Jun. 16, 1989, Ser. No. 367,225
Claims priority, application Japan, Sep. 28, 1988, 63-38029
Term of patent 14 years
U.S. Cl. D19—51

321,721

DOLL ILLUSTRATING DENTAL FEATURES

Joy Prager, 7921 Avenida Diestro, La Costa, Calif. 92009

Filed Feb. 16, 1989, Ser. No. 311,198

Term of patent 14 years

U.S. Cl. D19—59

321,722

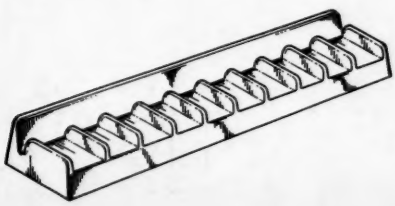
CARD BOARD FOR MEMORY OR THE LIKE

Nancy Helm-Estabrooks, Boston, and Edith Kaplan, Lexington, both of Mass., assignors to Special Press, Inc., San Antonio, Tex.

Filed Oct. 27, 1989, Ser. No. 427,628

Term of patent 14 years

U.S. Cl. D19—64



321,723

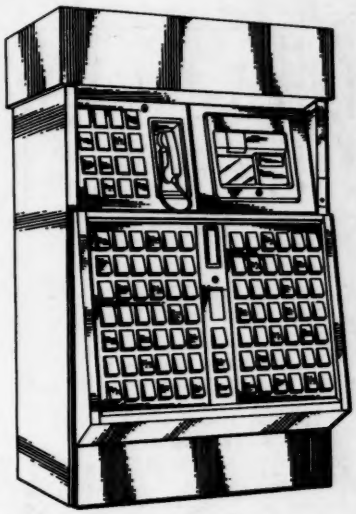
VIDEO DISPENSING MACHINE

John A. Lack, New York, N.Y., assignor to Nelson Vending Technology Limited, Mississauga, Canada

Filed May 16, 1989, Ser. No. 352,844

Term of patent 14 years

U.S. Cl. D20—1



321,724

ADJUSTABLE AND RETRACTABLE MENU AND ORDER DISPLAY UNIT FOR DRIVE-IN RESTAURANTS OR THE LIKE

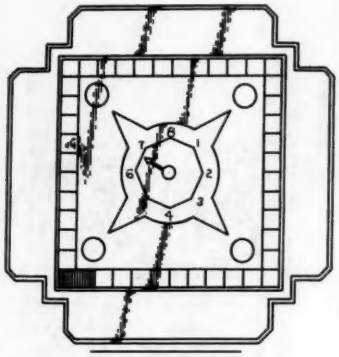
Frank R. Casale; Nicola D. Casale; Antonio A. Casale, and Richard P. Bennett, all of Albuquerque, N. Mex., assignors to Nunzio's Pizza, Inc., Beverly Hills, Calif.

Filed May 26, 1989, Ser. No. 358,196

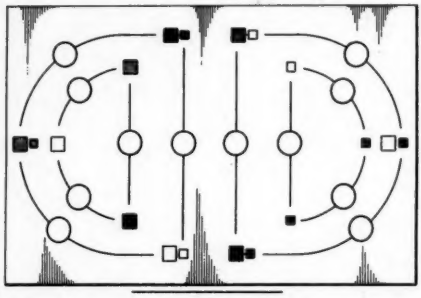
Term of patent 14 years

U.S. Cl. D20—19

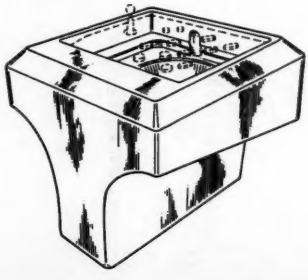
321,725
GAME BOARD
Larry Burleson, 1130 E. Ledbetter Dr., Dallas, Tex. 75216
Filed Aug. 7, 1989, Ser. No. 390,353
Term of patent 14 years
U.S. Cl. D21—22



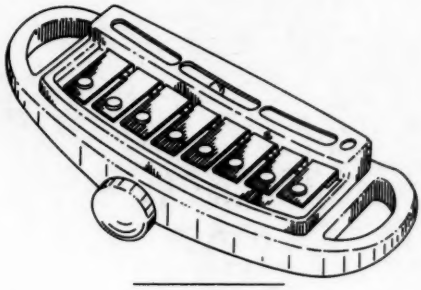
321,726
GAME BOARD
Robert A. Page, 30473 Mulholland Hwy. #139, Agoura, Calif. 91301
Filed Aug. 9, 1990, Ser. No. 565,106
Term of patent 14 years
U.S. Cl. D21—34



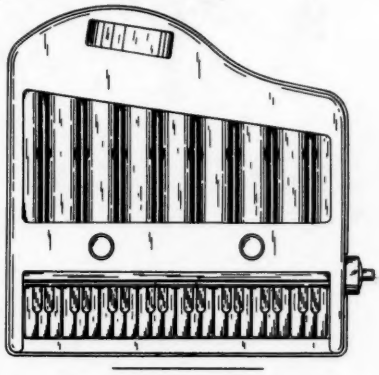
321,727
GAME CONTROL HOLDER
David C. Urbanski, 1794 Covington La., Eagan, Minn. 55126
Filed Oct. 16, 1989, Ser. No. 421,722
Term of patent 14 years
U.S. Cl. D21—48



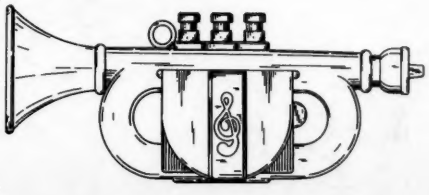
321,728
MUSICAL TOY
Stephen D. Wehmeyer, Cincinnati, Ohio, assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 16, 1989, Ser. No. 421,695
Term of patent 14 years
U.S. Cl. D21—64



321,729
TOY PIANO
Wade A. F. Maple, Elma, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 23, 1989, Ser. No. 425,850
Term of patent 14 years
U.S. Cl. D21—64



321,730
TOY TRUMPET
Craig J. McElhaney, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 23, 1989, Ser. No. 425,973
Term of patent 14 years
U.S. Cl. D21—64

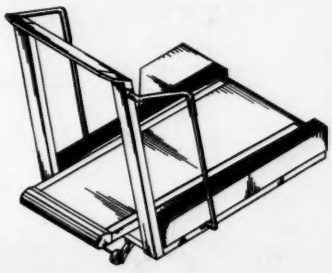


321,731
BOSS DOLL
Linda S. Carlson, Marathon; Kimberly J. Doering, and Suzanne M. Berner, both of Wausau, all of Wis., assignors to Hadit, Inc., Marathon, Wis.
Filed Nov. 1, 1989, Ser. No. 430,200
Term of patent 14 years
U.S. Cl. D21—171

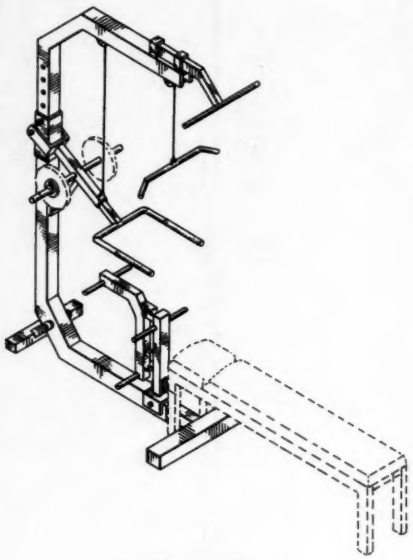
321,732
AERIAL TOY
Anton Furst, London, England, assignor to DC Comics Inc., New York, N.Y.
Filed Sep. 20, 1989, Ser. No. 410,246
Claims priority, application United Kingdom, Mar. 20, 1989, 1058000
Term of patent 14 years
U.S. Cl. D21—87

321,733
ISOKINETIC OSCILLATING EXERCISER
Bruce Hymanson, P.O. Box 5100, Playa del Rey, Calif. 90256
Continuation-in-part of Ser. No. 263,820, Oct. 28, 1988, Pat. No. 4,964,633. This application Oct. 27, 1989, Ser. No. 428,075
Term of patent 14 years
U.S. Cl. D21—191

321,734
LOW IMPACT TREADMILL
Paul T. Dunham, Everett; David J. Littrell, and Timothy O. Armstrong, both of Bellevue, all of Wash., assignors to Precor Incorporated, Bothell, Wash.
Filed Dec. 6, 1989, Ser. No. 443,427
Term of patent 14 years
U.S. Cl. D21—192

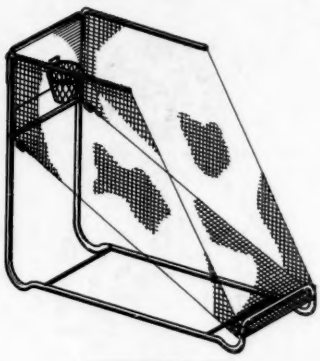


321,735
PHYSICAL EXERCISER
Jeffrey A. Blubaugh, 2351 South 183 West, Goddard, Kans. 67052
Filed Oct. 2, 1989, Ser. No. 415,535
Term of patent 14 years
U.S. Cl. D21—195

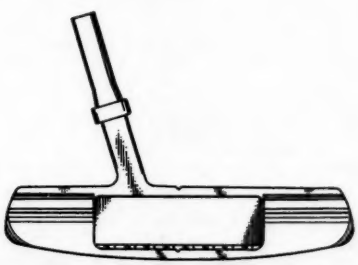


321,736
TABLETOP FOOTBALL GOAL AND NET
Irving H. Franklin, Brockton; Larry J. Franklin, Chestnut Hill; Richard Ferenz, Cohasset, and Kurt M. Gluck, North Easton, all of Mass., assignors to Franklin Sports Industries, Inc., Stoughton, Mass.
Filed Jul. 27, 1989, Ser. No. 385,915
Term of patent 14 years
U.S. Cl. D21—200

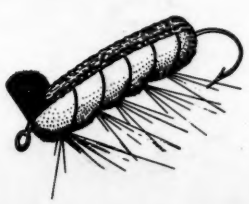
321,737
BASKETBALL TRAINING GOAL
Yuan H. Lo, No. 8-1, Tou Chien, Kan Kou Tsun, Lu Chu Hsiang, Tao Yuan Hsien, Taiwan
Filed Dec. 29, 1989, Ser. No. 458,819
Term of patent 14 years
U.S. Cl. D21—201



321,738
GOLF PUTTER HEAD
Jon R. Brown, Dallas, Tex., assignor to Highpoint Golf, Inc., Dallas, Tex.
Filed May 23, 1988, Ser. No. 197,898
Term of patent 14 years
U.S. Cl. D21—219

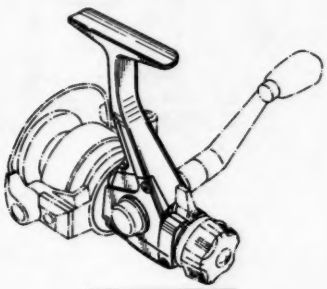


321,739
FISHING FLY
D. F. Tommy Thompson, 11329 38th Dr., Northeast, Marysville, Wash. 98270
Filed May 2, 1989, Ser. No. 346,094
Term of patent 14 years
U.S. Cl. D22—128



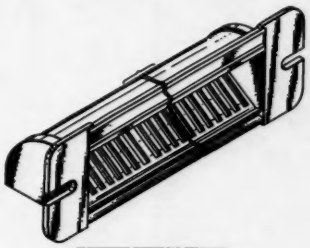
321,740
FISHING LURE
Dan L. Hook, 6535 Seaview Ave. Northwest, Seattle, Wash. 98117
Continuation of Ser. No. 122,411, Nov. 19, 1987, abandoned. This application Sep. 13, 1990, Ser. No. 583,708
Term of patent 14 years
U.S. Cl. D22—133

321,741
FISHING REEL BODY
Yasuhisa Kameda, and Akihisa Shiozaki, both of Musashino, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 17, 1989, Ser. No. 297,545
Claims priority, application Japan, Jul. 19, 1988, 63-28674
Term of patent 14 years
U.S. Cl. D22—141



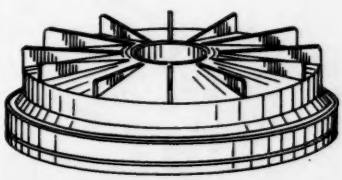
321,742
ARM SWIM FLOAT
Francis F. J. Yu, Taipei, Taiwan, assignor to Union Plastic Products Ltd., Taipei, Taiwan
Filed May 18, 1989, Ser. No. 353,517
Term of patent 14 years
U.S. Cl. D21—238

321,743
HOOD FOR VENT MOUNTING ON WINDOW SILL OR FRAME
Alan V. Logue, and William Divers, both of Dunmurry, Ireland, assignors to Brook Design Products Limited, Dunmurry, Northern Ireland
Filed Jun. 14, 1989, Ser. No. 365,562
Claims priority, application United Kingdom, Dec. 14, 1988, 1055688
Term of patent 14 years
U.S. Cl. D23—388



321,744
REEL SEAT FOR FISHING ROD
Yoshihiro Naeki, and Teiji Matsubara, both of Higashikurume, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Filed Jan. 17, 1989, Ser. No. 297,544
Claims priority, application Japan, Jul. 19, 1988, 63-28673
Term of patent 14 years
U.S. Cl. D22—142

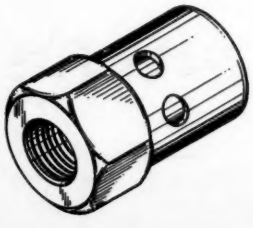
321,745
WATER FILTER
Spencer Murrell, Delaware City, Ohio, assignor to Wilton Industries, Inc., Woodridge, Ill.
Filed Jun. 15, 1990, Ser. No. 538,510
Term of patent 14 years
U.S. Cl. D23—209



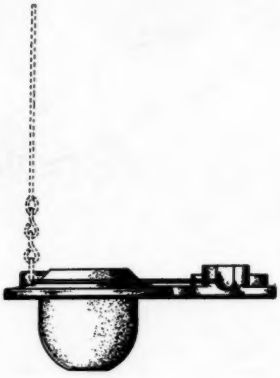
321,746
COMBINED SPRINKLER SUPPORT AND HOSE COUPLER
Haggie I. Cockman, P.O. Box 1725, Sanford, Fla. 32772-1725
Filed Jun. 23, 1988, Ser. No. 210,764
Term of patent 14 years
U.S. Cl. D23—221

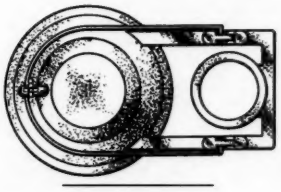
321,747
PRESSURIZED PAINT CUP
Marvin D. Burns, Millbury, Ohio, assignor to Ransburg Corporation, Indianapolis, Ind.
Filed Feb. 7, 1990, Ser. No. 477,205
Term of patent 14 years
U.S. Cl. D23—225

321,748
AIR GAP ANTI-SIPHON VALVE
Ralph Brito, 1514 Trenton Pl., Anaheim, Calif. 92802
Filed Nov. 21, 1988, Ser. No. 274,038
Term of patent 14 years
U.S. Cl. D23—235

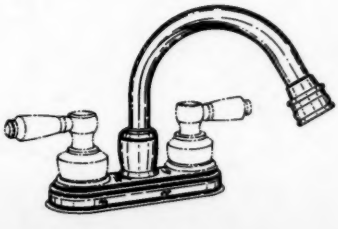


321,749
FLUSH TANK FLAPPER VALVE
Charles L. Wesolowsky, 8017 13th Ave. S., St. Petersburg, Fla. 33707
Filed May 30, 1989, Ser. No. 357,878
Term of patent 14 years
U.S. Cl. D23—236

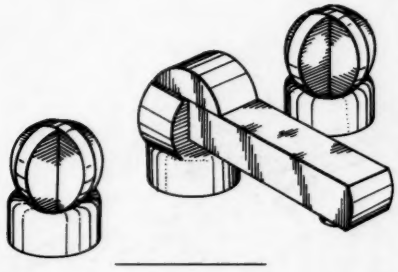




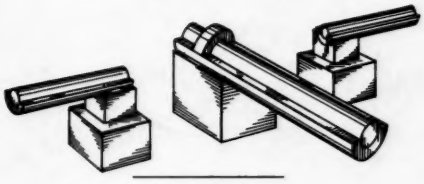
321,750
FAUCET BODY
Anthony G. Spangler, Sheridan, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Mar. 18, 1988, Ser. No. 170,423
Term of patent 14 years
U.S. Cl. D23—241



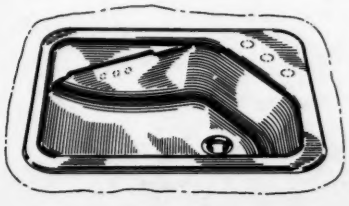
321,751
FAUCET SET
Stanley M. Paul, Greenwich, Conn., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Feb. 8, 1989, Ser. No. 308,248
Term of patent 14 years
U.S. Cl. D23—242



321,752
FAUCET SET
Stanley M. Paul, Greenwich, Conn., assignor to Paul Associates, Inc., Long Island City, N.Y.
Filed Feb. 8, 1989, Ser. No. 308,249
Term of patent 14 years
U.S. Cl. D23—242

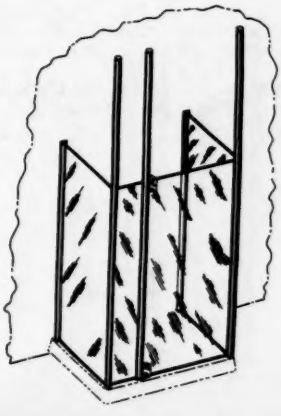


321,753
LAVATORY
Alan D. Bengtson, Sheboygan, and Robert S. Davis, Grafton, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1989, Ser. No. 297,917
Term of patent 14 years
U.S. Cl. D23—284

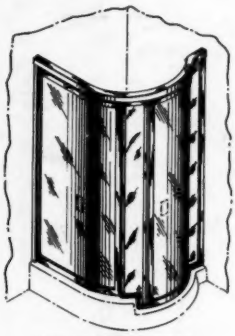


321,754
LAVATORY
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Division of Ser. No. 214,709, Jul. 1, 1988. This application Apr. 29, 1991, Ser. No. 693,275
Term of patent 14 years
U.S. Cl. D23—292

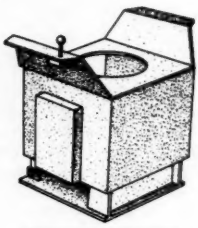
321,755
SHOWER ENCLOSURE
Keith L. Poulson, Canyon Country, Calif., and Todd D. Dannenberg, Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 11, 1988, Ser. No. 142,877
The portion of the term of this patent subsequent to Oct. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—305



321,756
SHOWER ENCLOSURE
Todd D. Dannenberg, Sheboygan, Wis., and Keith L. Poulson, Canyon Country, Calif., assignors to Kohler Co., Kohler, Wis.
Continuation-in-part of Ser. No. 142,871, Jan. 11, 1988. This application May 4, 1988, Ser. No. 190,274
Term of patent 14 years
U.S. Cl. D23—305

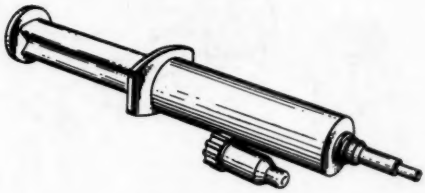


321,757
POWERED LIFT FOR COMMODE SEAT
T. Eric Aldred, 1105 Eighth St., Albany, Ga. 31707, and Hal A. Council, Albany, Ga., assignors to T. Eric Aldred, Albany, Ga.
Filed Aug. 25, 1989, Ser. No. 398,730
Term of patent 14 years
U.S. Cl. D23—311



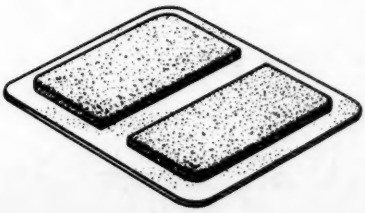
321,758
COVER FOR AN INTRAVENOUS BAG
Anita L. Colella, 4700 Sandyland Dr., #118, Carpenteria, Calif. 93013
Filed Mar. 9, 1989, Ser. No. 321,446
Term of patent 14 years
U.S. Cl. D24—127

321,759
SYRINGE
John F. Buswell, Redhill; Victor C. Cracknell, Windlesham, and Noshir J. Khambatta, Sussex, all of England, assignors to Beecham Group p.l.c., Brentford, England
Filed Dec. 2, 1988, Ser. No. 280,192
Claims priority, application United Kingdom, Jun. 4, 1988, 1051272
Term of patent 14 years
U.S. Cl. D24—130

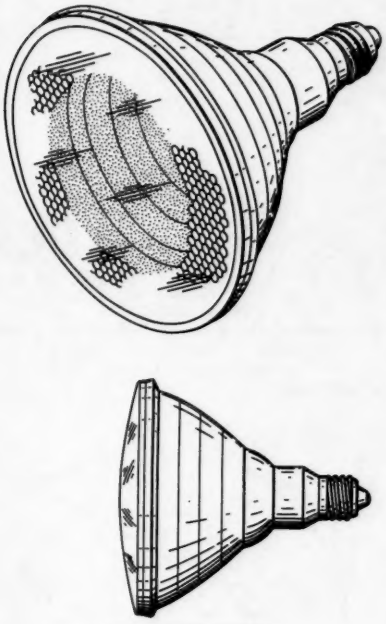


321,760
ORTHOPEDIC BACK SUPPORT PILLOW
Steven H. Carney, Denver, Colo., assignor to Steven Hull, Inc., Denver, Colo.
Filed Jun. 12, 1989, Ser. No. 364,985
Term of patent 14 years
U.S. Cl. D24—190

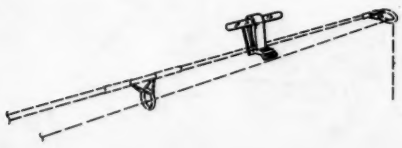
321,761
PAD FOR USE WITH A BODY ELECTRODE
Chuji Shimizu, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan
Filed Dec. 30, 1988, Ser. No. 292,000
Claims priority, application Japan, Sep. 5, 1988, 63-34987
Term of patent 14 years
U.S. Cl. D24—187



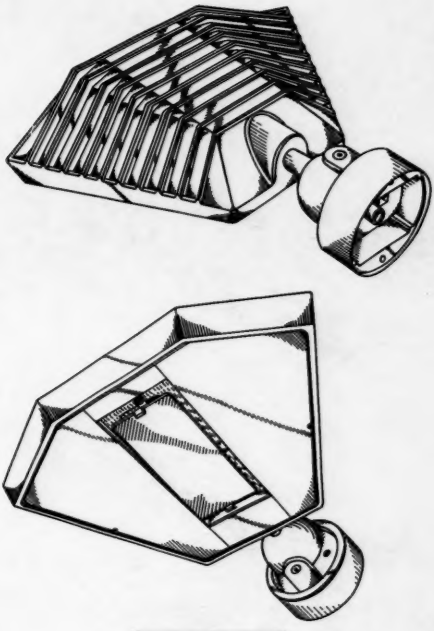
321,762
REFLECTOR SPOT LAMP
Mohammad Mujahid, Little Rock, and Joe O. Sullivan, Maumelle, both of Ark., assignors to North American Philips Corporation, New York, N.Y.
Filed Feb. 17, 1989, Ser. No. 312,779
Term of patent 14 years
U.S. Cl. D26—2



321,763
FISHING ROD LIGHT
Glenn N. Short, Rte. 4, Box 422, Rogersville, Mo. 65742
Filed Mar. 17, 1989, Ser. No. 325,890
Term of patent 14 years
U.S. Cl. D26—37



321,764
ADJUSTABLE LAMP
Hans Von Klier, Milan, Italy, assignor to Olivetti Synthesis SpA, Italy
Division of Ser. No. 287,997, Dec. 21, 1988, Pat. No. D. 315,804.
This application Jun. 13, 1990, Ser. No. 537,107
Claims priority, application Italy, Jun. 27, 1988, 53260/88[U]
Term of patent 14 years
U.S. Cl. D26—63



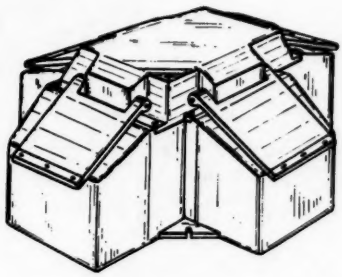
321,765
FLASHLIGHT BRACKET FOR A BICYCLE
William E. Morse, P.O. Box 3496, Santa Cruz, Calif. 95063
Filed Nov. 6, 1989, Ser. No. 432,665
Term of patent 14 years
U.S. Cl. D26—138

321,766
COMBINED COMB AND HOLDER FOR PERMANENT WAVE PAPER
Lowell C. Babcock, 1647 Park Ave., Sycamore, Ill. 60178, and Betty J. Bolger, R.R. 1, Box 534, Genoa, Ill. 60135
Filed Oct. 12, 1989, Ser. No. 420,833
Term of patent 14 years
U.S. Cl. D28—25

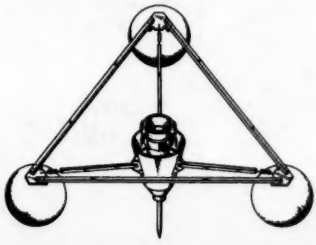
321,767
DENTAL FLOSS DISPENSER OR SIMILAR ARTICLE
Joseph Hemsley, Jr., 211 Bridgeboro Rd., Morrestown, N.J. 08057
Filed Feb. 20, 1990, Ser. No. 482,679
Term of patent 14 years
U.S. Cl. D28—64

321,768
TRAIL STALL FOR LIVESTOCK
Charles O. Yeager, Rte. 2, Box 77A, Otterville, Mo. 65348
Filed Jan. 12, 1989, Ser. No. 296,042
Term of patent 14 years
U.S. Cl. D30—114

321,769
ANIMAL DRINKER
Kenneth L. Schafer, Rte. 3, Box 73, LeSueur, Minn. 56058
Filed Feb. 20, 1990, Ser. No. 482,670
Term of patent 14 years
U.S. Cl. D30—132



321,770
SUSPENDED SUCTION HEAD FOR REMOVAL OF FREE FLOATING OIL
Patrick C. Armour, 667 Kingman Dr., Vacaville, Calif. 95687
Filed May 2, 1989, Ser. No. 346,754
Term of patent 14 years
U.S. Cl. D32—25



321,771

DRAINING-BOARD FOR DISHES AND CUTLERY

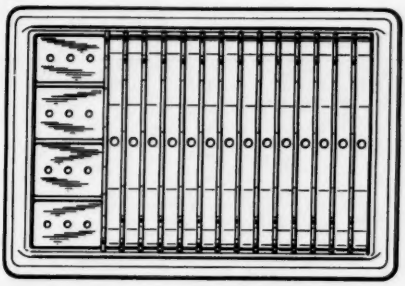
Sergio Cavicchia, Rome, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy

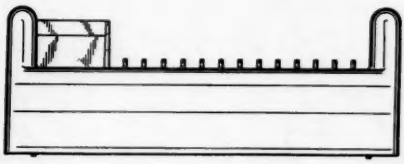
Filed Feb. 5, 1991, Ser. No. 650,647

Claims priority, application Italy, Aug. 8, 1990, 21635/90[U]

Term of patent 14 years

U.S. Cl. D32—55





321,772

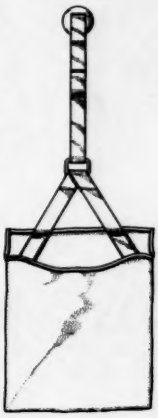
MOTOR VEHICLE REFUSE BAG OR SIMILAR ARTICLE

Steven J. Johnson, 235 Oakcrest Dr., Sharpsburg, Ga. 30277

Filed Mar. 8, 1991, Ser. No. 491,133

Term of patent 14 years

U.S. Cl. D34—1



321,773

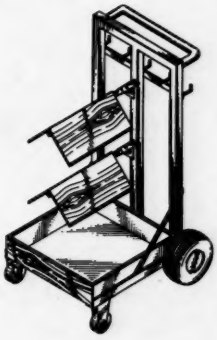
TACK CART

Raymond R. Chiang, P.O. Box 1281 North Rd., Whitefish, Mont. 59937

Filed Aug. 3, 1989, Ser. No. 388,917

Term of patent 14 years

U.S. Cl. D34—17



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TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF NOVEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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and apparatus for forming composite pieces from composite sheet material. 5,066,352, Cl. 156-265.000.

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Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 5,066,620, Cl. 501-21.000.

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Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 5,066,171, Cl. 408-1.00R.

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Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Koinuma, Masahiro, 5,066,967, Cl. 354-149.110.

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Osada, Masahiko; Arai, Masumi; and Akita, Shigeyuki, 5,066,893, Cl. 315-169.300.

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Tsuchiya, Toshio; Abe, Mitsuo; Arai, Nobuo; Hisatomi, Masumi; and Zama, Hideo, 5,067,038, Cl. 360-107.000.

Arai, Yasunari: *See*—
Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; Arai, Yasunari; and Ihara, Takeshi, 5,066,877, Cl. 307-603.000.

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Minefuji, Nobutaka; and Arai, Yasunori, 5,066,987, Cl. 355-233.000.

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Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,067,087, Cl. 364-474.240.

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Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; Terada, Tsutomu; Yamana, Masayuki; Nakai, Kazuhiro; and Araki, Takayuki, 5,066,747, Cl. 526-249.000.

Arato, Koji: *See*—
Sato, Takashi; Iwanabe, Yoji; Arato, Koji; Sakagami, Rokuro; and Yoneda, Yasuo, 5,065,809, Cl. 164-61.000.

Arcanum Corp.: *See*—
Huettenhain, Horst; Benz, August D.; and Getsoian, John, 5,066,310, Cl. 44-500.000.

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Gupta, Vijai P., 5,066,742, Cl. 526-216.000.
Hanak, Pavel; Motte, Philippe; and Gosset, Patrice, 5,066,685, Cl. 521-163.000.

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Kilbane, Farrell M.; Coleman, Richard A.; Dunbar, Frank C.; and Gibson, Alan F., 5,066,549, Cl. 428-653.000.

Armstrong International, Inc.: *See*—
Deacon, Walter T.; and Vyve, Albert V., 5,065,785, Cl. 137-185.000.

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Felter, Richard E.; Markley, Dean A.; and Musser, Deborah L., 5,066,422, Cl. 252-511.000.

Arnold, Jean-Claude; Cyprien, Guy; and Olivere, Jean-Francois, to Rhone-Poulenc Chimie. Fountain for the release of active agents into water drawn from wells. 5,066,468, Cl. 422-266.000.

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Leighton, John C.; Iovine, Carmine P.; Aronson, Michael P.; and Elliott, David L., 5,066,749, Cl. 526-271.000.

Art Guild, Inc.: *See*—
Zegel, Douglas R.; Jensen, Gary S.; Hernick, Mark R.; and Daniels, Michael J., 5,065,559, Cl. 52-239.000.

Arthur, James D.; Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Davis, Robert J., to Axonn Corporation. Wireless alarm system. 5,067,136, Cl. 375-1.000.

Asahi Chemical Research Laboratory Co., Ltd.: *See*—
Isawa, Yamahiro; Morooka, Isao; and Oba, Yoichi, 5,066,692, Cl. 523-458.000.

Asahi Glass Company, Ltd.: *See*—
Hirano, Akira, 5,066,102, Cl. 359-630.000.
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 5,066,620, Cl. 501-21.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Miyazaki, Makoto; and Hiyoshi, Tatsuo, 5,066,682, Cl. 521-27.000.
Muto, Yoshihiko; Watanabe, Kohei; Yasukata, Koichi; and Sakurai, Tomoyuki, 5,066,397, Cl. 210-321.610.

Asahi Kogaku Kogyo K.K.: *See*—
Sugawara, Saburo, 5,066,115, Cl. 359-676.000.
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Koinuma, Masahiro, 5,066,967, Cl. 354-149.110.

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Kawano, Kiyoshi, 5,066,966, Cl. 354-82.000.
Kawasaki, Masahiro, 5,066,969, Cl. 354-402.000.
Minefuji, Nobutaka; and Arai, Yasunori, 5,066,987, Cl. 355-233.000.
Suzuki, Noboru; Toji, Shigeo; and Kawasaki, Masahiro, 5,066,968, Cl. 354-400.000.
Tanaka, Hitoshi; and Kosako, Kosei, 5,066,965, Cl. 354-64.000.

Asahi Seiko Kabushiki Kaisha: *See*—
Abe, Hiroshi, 5,066,262, Cl. 453-57.000.

Asakura, Eizo: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Misaki, Toshihiro; Kitano, Motoi; and Yoshida, Hideyuki, 5,066,475, Cl. 423-622.000.

Asano, Hajime: *See*—
Miyao, Kouji; and Asano, Hajime, 5,067,070, Cl. 395-146.000.

Asano, Masamichi; Iwahashi, Hiroshi; and Yokoyama, Sadayuki, to Kabushiki Kaisha Toshiba. Semiconductor memory device having a majority logic for determining data to be read out. 5,067,111, Cl. 365-189.080.

Asbeck, Lutz S.; and Segers, Jacobus C., to Van den Bergh Foods Co., Division of Conopco, Inc. Dewaxing of dried oil. 5,066,504, Cl. 426-417.000.

ASEA Brown Boveri Ltd.: *See*—
Brandle, Hubert; Schultheis, Lothar; and Ruegg, Walter, 5,066,097, Cl. 385-76.000.

Ashikawa, Noboru: *See*—
Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 5,065,836, Cl. 180-245.000.

Ashmore, Sam C.: *See*—
Hodges, Hency C., Sr.; Hodges, Henry C., Jr.; Ashmore, Sam C.; and Piersol, Allan G., 5,065,618, Cl. 73-146.000.

Ashpitel, William G.; and Parsons, Ralph G. W., to British Petroleum Company, p.l.c., The. Gauge for measuring bending of structures. 5,065,631, Cl. 73-849.000.

AT&T Bell Laboratories: *See*—
Azar, Kaveh, 5,067,047, Cl. 361-384.000.
Basavanhally, Nagesh R., 5,065,933, Cl. 228-102.000.
Brady, Michael F.; Dorey, John K., II; and Helms, Aubrey L., Jr., 5,066,615, Cl. 437-229.000.
Denker, John S.; Howard, Richard E.; Jackel, Lawrence D.; and LeCun, Yann, 5,067,164, Cl. 382-15.000.
Farel, Richard A.; and Gawande, Mohan, 5,067,074, Cl. 395-200.000.
Fischer, Frederick H.; Lee, Kuo-hua; Nagy, William J.; and Selamoglu, Nur, 5,066,998, Cl. 357-51.000.
Gordon, Alexander; and Vella-Coleiro, George P., 5,067,173, Cl. 359-152.000.
Hollesen, David B.; Kaczorek, Joseph W.; and Treible, Edwin S., 5,065,692, Cl. 118-302.000.
Krishnakumar, Anjur S.; Krishnamurthy, Bala; and Sabnani, Krishan K., 5,067,104, Cl. 395-375.000.
Liu, Jay J.; and Wong, Y. H., 5,065,931, Cl. 228-19.000.
Novembre, Anthony E., 5,066,566, Cl. 430-296.000.

Athanassoulias, Costa: *See*—
Lane, Christopher C.; Lenz, Ruben P.; and Athanassoulias, Costa, 5,066,335, Cl. 134-7.000.

Athans, George C.: *See*—
Athans, Leonidas; and Athans, George C., 5,066,035, Cl. 280-441.100.

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Bloys, James B.; and Wilton, Bonsall S., 5,065,820, Cl. 166-291.000.

Atmel Corporation: *See*—
Wu, Tsung-Ching; and Chern, Geeng-Chuan, 5,066,992, Cl. 357-23.500.

Atochem: *See*—
Colombier, Christian, 5,066,734, Cl. 525-478.000.
Atsugi Unisia Corporation: *See*—
Kaneda, Ichiro; Yamamoto, Seiji; and Fujii, Natsuji, 5,066,075, Cl. 303-113.00R.
Atsumi, Kunio: *See*—
Sato, Yasuo; Kato, Shinsuke; Taniguchi, Takako; Atsumi, Kunio; Hachisu, Mitsugu; and Shibahara, Seiji, 5,066,677, Cl. 514-563.000.
Audett, Jay D., to Exxon Chemical Patents Inc. Radiation-reactive phenylbutadiene multiblock copolymers. 5,066,728, Cl. 525-314.000.
Augurt, Thomas A., to Propper Manufacturing Company, Inc. Prevacuum steam sterilization test pack. 5,066,464, Cl. 422-58.000.
Aulabaugh, R. Michael. Trash bag holder. 5,065,965, Cl. 248-99.000.
Ausimont S.p.A.: *See*—
Braga, Vittorio; Manica, Michele; Martini, Emilio; and Milani, Federico, 5,066,700, Cl. 524-380.000.
Austin, Leslie W.: *See*—
Van Vooren, Charles R.; and Austin, Leslie W., 5,066,032, Cl. 280-304.100.
Australian National University, The: *See*—
Maddess, Teddy L., 5,065,767, Cl. 128-745.000.
Australian Wire Industries Pty. Limited: *See*—
Robertson, Malcolm A., 5,066,519, Cl. 429-349.000.
Austria Metall Aktiengesellschaft: *See*—
Garnweidner, Peter, 5,066,064, Cl. 296-146.000.
Automatic Switch Company: *See*—
Wiktor, Dominik M.; and Schlindwein, Siegfried, 5,066,840, Cl. 200-330.000.
Automatik Apparate-Maschinenbau GmbH: *See*—
Hunke, Friedrich, 5,066,210, Cl. 425-71.000.
Avis, Graham M.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.
AVL AG: *See*—
Skrabal, Falko, 5,066,283, Cl. 604-152.000.
Axis S.p.A.: *See*—
Luciano, Santandrea; and Massimo, Lombardi, 5,065,499, Cl. 29-799.000.
Axis, U.S.A., Inc.: *See*—
Luciani, Sabatino; and Lumini, Antonio, 5,065,503, Cl. 29-735.000.
Axonn Corporation: *See*—
Arthur, James D.; Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Davis, Robert J., 5,067,136, Cl. 375-1.000.
Axtell, Lloyd L., to Hyster Company. Compound pull cable operating lever. 5,065,643, Cl. 74-501.600.
Azar, Kaveh, to AT&T Bell Laboratories. Circuit pack with inboard jet cooling. 5,067,047, Cl. 361-384.000.
Azrak-Hamway International Inc.: *See*—
Driska, John J., 5,066,006, Cl. 273-1.50R.
Azuma Tekko Kabushiki Kaisha: *See*—
Shimada, Kazumi; and Chikazawa, Masaaki, 5,066,186, Cl. 414-221.000.
B. F. Goodrich Company, The: *See*—
Phillips, Ronald W., II, 5,066,446, Cl. 264-242.000.
Rhodes, Larry F., 5,066,740, Cl. 526-160.000.
Baach, Miachel K.: *See*—
Kroon, David H.; Goldsmith, Gary; Baach, Miachel K.; and Bushman, James B., 5,065,893, Cl. 220-565.000.
Baasner, Bernd; Beck, Gunther; Heitzer, Helmut; and Scaller, Klaus, to Bayer Aktiengesellschaft. 1-trifluoromethyl-1-nitro-2-alkoxy-2-arylethanes, their preparation and antimycotic agents containing them. 5,066,681, Cl. 514-716.000.
Baba, Yasuhiro; and Moritake, Masanori, to Nippon Electric Glass Co., Ltd. Crystallized glass article with colored small masses dispersed in a surface thereof. 5,066,524, Cl. 428-15.000.
Babb, David A.: *See*—
Clement, Katherine S.; Babb, David A.; and Ezzell, Bobby R., 5,066,746, Cl. 526-242.000.
Babcock & wilcox Co., The: *See*—
Carpenter, Steven P.; Cavinee, James C.; and Krannitz, James J., 5,065,472, Cl. 15-317.000.
Hancock, Jimmy W.; Kelly, Michael J.; Latham, Wayne M.; and Stinnett, Carlton E., 5,066,452, Cl. 376-252.000.
Babler, Egon S.; Gottwald, Johannes F.; Gruber, Dennis W.; Kearney, James F.; Mayer, William J.; and Olsen, Alf J., to Xerox Corporation. Low cost quiet impact printer. 5,066,150, Cl. 400-157.300.
Babuder, Gerald A.: *See*—
Weigl, Jeffrey L.; and Babuder, Gerald A., 5,066,051, Cl. 285-328.000.
Backus, Walter E.: *See*—
Bhatia, Kumar G.; Backus, Walter E.; and Hagelin, Jack S., 5,065,959, Cl. 244-54.000.
Bagchi, Pranab: *See*—
O'Connor, Kevin M.; Szajewski, Richard P.; and Bagchi, Pranab, 5,066,572, Cl. 430-503.000.
Bailey, John M., to Caterpillar Inc. Particulate trap regeneration apparatus and method. 5,065,574, Cl. 60-274.000.
Bailey, Raymond J., to Americraft Corporation. Changeable letter sign system. 5,065,537, Cl. 40-618.000.
Bailey, Terry R.: *See*—
Kult, Roger R.; Bailey, Terry R.; and Tolliver, Howard R., 5,066,098, Cl. 359-540.000.
Baird, William C., Jr.; and Swan, George A., to Exxon Research & Engineering Company. Reforming catalyst. 5,066,632, Cl. 502-223.000.
Baisch, Gabriele: *See*—
Francotte, Eric; and Baisch, Gabriele, 5,066,793, Cl. 536-50.000.
Baker, Christopher W.: *See*—
Hartman, Thomas G.; Manura, John J.; Overton, Santford V.; Baker, Christopher W.; and Manos, John N., 5,065,614, Cl. 73-23.350.
Baker Hughes Incorporated: *See*—
Kruger, Volker; and Panzke, Rolf, 5,065,826, Cl. 175-75.000.
Young, Terry G., 5,065,666, Cl. 91-518.000.
Baker, James C.; Kazecki, Henry L.; and Goode, Steven H., to Motorola, Inc. Coherent detector for QPSK modulation in a TDMA system. 5,067,139, Cl. 375-86.000.
Balakrishnan, Ramesh: *See*—
Taylor, Bruce S.; and Balakrishnan, Ramesh, 5,065,673, Cl. 100-40.000.
Balatin, Sergio E.: *See*—
Savino, Thomas G.; Balch, Thomas C.; Steinmetz, Alan J.; Balatin, Sergio E.; and Caiozzo, Nicholas, 5,066,732, Cl. 525-440.000.
Balavich, Nancy P., to Revlon, Inc. Composite containers. 5,065,875, Cl. 215-10.000.
Balch, Thomas C.: *See*—
Savino, Thomas G.; Balch, Thomas C.; Steinmetz, Alan J.; Balatin, Sergio E.; and Caiozzo, Nicholas, 5,066,732, Cl. 525-440.000.
Balda, Raymond J.: *See*—
Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., 5,067,002, Cl. 357-59.000.
Baldacci, Massimo: *See*—
Caccia, Giulio; and Baldacci, Massimo, 5,066,676, Cl. 514-562.000.
Baldwin, Jack E., to Lilly Industries Limited. Process for preparing cepham intermediates. 5,066,797, Cl. 540-215.000.
Ballard Medical Products: *See*—
Jensen, Billy M., 5,065,754, Cl. 128-200.260.
Ballentine, Richard E.; and Harris, Joseph W., to J. W. Harris Co., Inc. Phosphorous copper based alloy with tin and antimony. 5,066,456, Cl. 420-472.000.
Ban, Hitoshi: *See*—
Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, 5,066,201, Cl. 417-222.00R.
Ban, Shigeru: *See*—
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.
Banerjee, Sanjay K., to Texas Instruments Incorporated. Method of making a trench DRAM cell with dynamic gain. 5,066,607, Cl. 437-52.000.
Bannai, Hiroyuki; and Kato, Hironori, to Alps Electric Co., Ltd. Clock spring. 5,066,239, Cl. 439-164.000.
Banno, Yoshikazu: *See*—
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,066,883, Cl. 313-309.000.
Banon, Louis. Permanent magnet polyphase synchronous machine. 5,066,880, Cl. 310-156.000.
Barb, Lewis E.: *See*—
Chapman, Richard L.; and Barb, Lewis E., 5,065,488, Cl. 29-278.000.
Barber, Duane G.: *See*—
Meyer, Richard C.; and Barber, Duane G., 5,066,135, Cl. 366-208.000.
Bardasz, Ewa A., to Union Camp Corporation. Terpinene-maleic anhydride adduct derivatives as corrosion inhibitors. 5,066,461, Cl. 422-16.000.
Bardin, Christian; Pignard, Guy; Boulet, Jean; and Morin, Pierre, to Institut Francais du Petrole. Method and device for remote-controlling drill string equipment by a sequence of information. 5,065,825, Cl. 175-38.000.
Barens, Ivor. Variable ratio transmission. 5,065,638, Cl. 74-351.000.
Bares, Steven J., to Hewlett-Packard Company. Method and apparatus for measuring the print quality of print media receiving ink jet inks. 5,065,620, Cl. 73-159.000.
Barett, David M.: *See*—
Barrett, David M.; and Brown, Timothy J., 5,065,805, Cl. 160-23.100.
Barito, Mary O.: *See*—
Barito, Robert W.; and Barito, Mary O., 5,066,437, Cl. 264-46.500.
Barito, Robert W.; and Barito, Mary O. Method for insulating thermal devices. 5,066,437, Cl. 264-46.500.
Bark, Jeffrey E.; Hillegass, Donald V.; and Woodruff, Eric J., to Medical Engineering Corporation. Self-sealing tissue expander and method. 5,066,303, Cl. 623-8.000.
Barkley & Dexter Laboratories: *See*—
Moran, James M., 5,066,937, Cl. 336-84.00C.
Baroid Technology, Inc.: *See*—
Egbert, Gary L.; and Ziegler III, Philip L., 5,066,059, Cl. 294-82.160.
Read, Shannon R., 5,066,052, Cl. 285-334.000.
Baron, Carl N.; Merkel, Stephen L.; and Hall, Robert C., to Nordson Corporation. Apparatus for compensating for non-linear flow characteristics in dispensing a coating material. 5,065,695, Cl. 118-688.000.
Barrett, David M.; and Brown, Timothy J., to Barett, David M. Display enclosure and segmented flexible closure therefor. 5,065,805, Cl. 160-23.100.

Barrett, David M. Brake-disc-rotor attacher impeller (intersecting-/locker). 5,065,848, Cl. 192-1.360.

Barry, Donald J.: *See—*
Huber, Charles D.; and Barry, Donald J., 5,066,529, Cl. 428-40.000.

Bartlett, John R.: *See—*
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.

Bartlett, Robert L.: *See—*
Legler, John G.; Bartlett, Robert L.; and Flora, David D., 5,065,652, Cl. 83-168.000.

Bartley, Harold D.; and Gaiser, William R., to Broadway Companies, Inc. Blow-molded bottle with bi-axially stretched skirt. 5,066,081, Cl. 215-1.00C.

Basavanhally, Nagesh R., to AT&T Bell Laboratories. Electronic device manipulating apparatus and method. 5,065,933, Cl. 228-102.000.

BASF Aktiengesellschaft: *See—*
Angel, Maximilian; and Einwiller, Andreas, 5,066,715, Cl. 524-812.000.
Hansen, Guenter; Lamm, Gunther; and Loeffler, Hermann, 5,066,791, Cl. 534-772.000.
Helwig, Reinhard; and Hoch, Helmut, 5,066,820, Cl. 522-249.000.
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

BASF Corporation: *See—*
Yeh, Ling; Harrelson, Hugh G.; and Coons, Andrew M., III, 5,066,308, Cl. 8-403.000.

BASF Corporation, Inmont Division: *See—*
Savino, Thomas G.; Balch, Thomas C.; Steinmetz, Alan J.; Balatin, Sergio E.; and Caiozzo, Nicholas, 5,066,732, Cl. 525-440.000.

BASF Lacke & Farben AG: *See—*
Hille, Hans-Dieter; and Dobbelstein, Arnold, 5,066,759, Cl. 528-60.000.

Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, to North American Philips Corporation. Method and apparatus for demodulating chrominance signals using a training signal in place of a color burst signal. 5,067,011, Cl. 358-23.000.

Bass, Joseph D.; and Steinhilber, Leroy H. Boat propeller guard. 5,066,254, Cl. 440-72.000.

Bassett, John A., to Computer Products, Inc. DC/DC converter switching at zero voltage. 5,066,900, Cl. 323-224.000.

Bathemes, Pete: *See—*
Liston, Jack L.; Pipella, Michael; and Bathemes, Pete, 5,066,405, Cl. 210-693.000.

Baton Labs, Inc.: *See—*
Betton, Arnold L.; and Hirzel, Edgar A., 5,066,905, Cl. 324-133.000.

Battelle Memorial Institute: *See—*
—Bunnell, Lee R., Sr., 5,065,948, Cl. 241-199.500.

Baughman, Milo. Containerized retractable/expandable sleeping compartment for vehicles. 5,066,065, Cl. 296-165.000.

Bauman, Randall L.: *See—*
Greenberg, William M.; and Bauman, Randall L., 5,065,696, Cl. 118-718.000.

Baumann, Jurgen: *See—*
Konig, Gert; and Baumann, Jurgen, 5,066,624, Cl. 501-107.000.

Baumann, Karl, to CL Pharma Aktiengesellschaft. 3,5-dimethyl-4-methoxypyridine derivatives. 5,066,810, Cl. 546-300.000.

Baumbach, Thorkild O. Method and means for connecting a branch conduit to an existing conduit. 5,065,780, Cl. 137-15.000.

Baumert, Dietrich: *See—*
Buhmann, Ulrich; Joppien, Hartmut; and Baumert, Dietrich, 5,066,675, Cl. 514-544.000.

Baverische Motoren Werke AG: *See—*
Kindermann, Siegfried; Gyory, Emil; and Heiland, Hans, 5,066,041, Cl. 280-772.000.

Baxi, Indra R.; and Erikson, Erik E., to Encore Molding Systems, Inc. Injection molding apparatus. 5,066,214, Cl. 425-190.000.

Baxter, Dennis E.; and Stoneham, Jeffrey R., to Eastman Kodak Company. Film cassette with film exposure status indicator. 5,065,952, Cl. 242-71.100.

Baxter International Inc.: *See—*
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 5,066,290, Cl. 604-408.000.

Bayer Aktiengesellschaft: *See—*
Baasner, Bernd; Beck, Gunther; Heitzer, Helmut; and Scaller, Klaus, 5,066,681, Cl. 514-716.000.
Dorf, Ernst-Ulrich; Reinking, Klaus; Jakob, Wolfgang; Tresper, Erhard; and Russeler, Wolfgang, 5,066,775, Cl. 528-388.000.
Eichenauer, Herbert; Wittmann, Dieter; Schmidt, Adolf; and Ott, Karl-Heinz, 5,066,717, Cl. 525-67.000.
Kohler, Burkhard; and Meyer, Rolf-Volker, 5,066,781, Cl. 528-481.000.
Pitzer, Ulrike; Franz, Gerhard; and Laubach, Benno, 5,066,473, Cl. 423-344.000.
Russeler, Wolfgang; Idel, Karsten-Josef; Dorf, Ernst-Ulrich; Alewelt, Wolfgang; and Freitag, Dieter, 5,066,776, Cl. 528-388.000.
Wehnert, Wolfgang; Reinking, Klaus; Bier, Peter; Kraft, Klaus; and Tresper, Erhard, 5,066,704, Cl. 524-449.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Dangl, Wolfgang; Schick, Gerald; Nowack, Reinhard; and Reuber, Gerhard, 5,066,040, Cl. 280-756.000.
Hantsch, Hartmut; Thoma, Peter; and Mahalek, Josef, 5,067,076, Cl. 395-275.000.

Bea-Bar Enterprises Ltd.: *See—*
McLean, John A. B., 5,065,969, Cl. 248-282.000.

Beaver, Richard N.: *See—*
Byrd, Carl E.; Kelly, Stephen L.; and Beaver, Richard N., 5,066,380, Cl. 204-290.00R.

Becher, Frank, to Lts Lohmann Therapie-Systeme GmbH & Co. KG. Transdermal therapeutic system. 5,066,494, Cl. 424-448.000.

Bechtel Group, Inc.: *See—*
Huettenhain, Horst; Benz, August D.; and Getsoian, John, 5,066,310, Cl. 44-500.000.

Beck, Gunther: *See—*
Baasner, Bernd; Beck, Gunther; Heitzer, Helmut; and Scaller, Klaus, 5,066,681, Cl. 514-716.000.

Becker, Bernard, to Siemens Aktiengesellschaft. Fitting for joining at least one hybrid burner to apparatus for supplying a fluid fuel. 5,066,221, Cl. 431-280.000.

Beckman Instruments, Inc.: *See—*
Meyer, Richard C.; and Barber, Duane G., 5,066,135, Cl. 366-208.000.

Becraft, Lloyd G., to Conoco Inc. Manufacture of isotropic coke. 5,066,385, Cl. 208-131.000.

Becton Dickinson and Company: *See—*
Lee, Linda, 5,066,580, Cl. 435-721.000.
Mersch, Steve H.; Spielvogel, David E.; and Daugherty, Charles W., 5,066,284, Cl. 604-168.000.

Beecham Group p.l.c.: *See—*
Dorgan, Roderick J.; and Macaulay, Graham S., 5,066,670, Cl. 514-450.000.
Driver, Michael J.; Greenlees, Alexander R.; and MacPherson, David T., 5,066,646, Cl. 514-31.000.
Kincey, Peter M., 5,066,805, Cl. 544-277.000.

Begemann, Malcolm J. S.; de Vries, Bernhard; and van der Veen, Johannes S., to Vitatron Medical B.V. Pacemaker with optimized rate responsiveness and method of rate control. 5,065,759, Cl. 128-419.0PG.

Behr, R. Douglas, to DowBrands Inc. Process and apparatus for reducing color contamination in the process recycle of zippered thermoplastic bags. 5,066,444, Cl. 264-171.000.

Bekum Maschinenfabriken GmbH: *See—*
Roos, Uwe-Volker; and Gittner, Franz, 5,066,222, Cl. 432-5.000.

Belikan, Thomas; and Krauss, Werner, to Richard Wolf GmbH. Ultrasonic wave coupler for locating transducer in a lithotriptic apparatus. 5,065,742, Cl. 128-24.0EL.

Bell, Lon E.: *See—*
Gunning, Kevin J.; Gallup, David F.; and Bell, Lon E., 5,066,837, Cl. 200-61.45R.

Bell, Malcolm R.: *See—*
D'Ambra, Thomas E.; and Bell, Malcolm R., 5,066,803, Cl. 544-101.000.

Bellingham, Godfrey, to Bellingham Medical, Inc. Quick use suture package. 5,066,299, Cl. 606-213.000.

Bellingham Medical, Inc.: *See—*
Bellingham, Godfrey, 5,066,299, Cl. 606-213.000.

Beloit Corporation: *See—*
Skaugen, Borgeir; and Wedel, Gregory L., 5,065,529, Cl. 34-117.000.

Beltran, Adrian M.; and Kreischer, Charles H., to General Electric Company. Advanced high-temperature brazing alloys. 5,066,459, Cl. 420-58.800.

Bemis, Claude: *See—*
Castrigno, Steven; Rafferty, Scott E.; Nichols, Lawrence R.; and Bemis, Claude, 5,066,037, Cl. 280-732.000.

Bemis, Peter F.: *See—*
DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.

Bender, Franz: *See—*
Panten, Detlef; Hertweck, Gernot; and Bender, Franz, 5,065,719, Cl. 123-339.000.

Bendix Atlantic Inflator Company: *See—*
Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, 5,066,038, Cl. 200-737.000.

Benecke, Wolfgang, to Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.V. Instrument for measuring accelerations and process of making the same. 5,065,628, Cl. 73-517.00R.

Benjamin, Gary H., to Cooper Tire and Rubber Company. Building drum for a tire belt-tread stock package. 5,066,354, Cl. 156-414.000.

Bennett, Harold R.: *See—*
Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,066,516, Cl. 427-118.000.

Benz, August D.: *See—*
Huettenhain, Horst; Benz, August D.; and Getsoian, John, 5,066,310, Cl. 44-500.000.

Beran, Anthony V., to Respiratory Support Products, Inc. Temperature measurement. 5,066,140, Cl. 374-134.000.

Berchenko, Vladimir M.: *See—*
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.

Bercu, Barry B., to University of South Florida. Method for improving the accuracy of diagnosis of growth hormone deficiency. 5,065,747, Cl. 128-630.000.

Bercu, Barry B., to University of South Florida. Method of diagnosing growth hormone disorders employing somatostatin and growth hormone releasing hormone. 5,065,748, Cl. 128-630.000.

Bergen, James R.; Burt, Peter J.; Hingorani, Rajesh; and Peleg, Shmuel, to David Sarnoff Research Center, Inc. Three-frame technique for analyzing two motions in successive image frames dynamically. 5,067,014, Cl. 358-105.000.

Berger, Scott B., to Cornell Research Foundation, Inc. Apparatus and method for rotating of three-dimensional images. 5,067,167, Cl. 382-46.000.

Berges, Hanns-Peter; Fischer, Berthold; Mueller, Peter; and Vorberg, Dieter, to Leybold Aktiengesellschaft. Method and apparatus for delivering oil to a multi-stage pump. 5,066,202, Cl. 417-228.000.

Bergomi, Maria P.: *See*—
Gemert, Barry V.; and Bergomi, Maria P., 5,066,818, Cl. 549-389.000.

Berkeley, Arnold D.; Bernstein, Alec; and Carney, Daniel C., to Berkeley, Arnold D. Interactive electronic thermostat with installation assistance. 5,065,813, Cl. 165-1.000.

Bernhard, Jean-Francois, to Bron Elektronik AG. Method and apparatus for measuring the flash duration of a flash unit. 5,066,121, Cl. 356-218.000.

Bernstein, Alec: *See*—
Berkeley, Arnold D.; Bernstein, Alec; and Carney, Daniel C., 5,065,813, Cl. 165-1.000.

Bernstein, Philip: *See*—
Kamen, Melvin E.; and Bernstein, Philip, 5,066,486, Cl. 424-63.000.

Bernstein, Steven: *See*—
Speiser, Robert D.; Bernstein, Steven; Miller, Charles N.; and Shearer, Dane, 5,065,549, Cl. 51-288.000.

Berryer, Michel, to Outboard Marine Corporation. Tool bit. 5,066,170, Cl. 407-54.000.

Bertenshaw, David R.; Williamson, Richard; and Wright, John, to Strand Lighting Limited. Electric lighting and power controllers therefor. 5,066,896, Cl. 315-291.000.

Bertin, Patrice; and Pankowiak, Christian, to Valeo. Actuator for a servo controlled clutch with lubricating mechanism. 5,065,850, Cl. 192-90.000.

Bertrand, Patrick, to Essilor International, Cie Generale d'Optique. Optical device for phase detection testing optical systems, especially ophthalmic lenses. 5,066,119, Cl. 356-124.000.

Bertrand, Patrick, to Essilor International, Cie Generale d'Optique. Optical device for phase detection testing optical system, especially ophthalmic lenses. 5,066,120, Cl. 356-124.000.

Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, to U.S. Philips Corporation. Dispersion strengthened lead-tin alloy solder. 5,066,544, Cl. 428-614.000.

Betton, Arnold L.; and Hirzel, Edgar A., to Baton Labs, Inc. Battery cable assembly with in-line switch. 5,066,905, Cl. 324-133.000.

Betts, Colin: *See*—
Heppenstall, Neil G.; Betts, Colin; and Ford, James, 5,066,453, Cl. 376-352.000.

Beutler Heating and Air Conditioning, Inc.: *See*—
Wylie, Calvin R.; and Crites, Patrick H., 5,065,585, Cl. 62-89.000.

Bey, Philippe; and Kolb, H. Michael, to Merrell Dow Pharmaceuticals Inc. Difluoroglutamic acid conjugates with folates and anti-folates for the treatment of neoplastic diseases. 5,066,828, Cl. 560-171.000.

Bhandari, Pradeep; and Fujita, Toshio, to United States of America, National Aeronautics and Space Administration. Thermal power transfer system using applied potential difference to sustain operating pressure difference. 5,066,337, Cl. 136-202.000.

Bhatia, Kumar G.; Backus, Walter E.; and Hagelin, Jack S., to Boeing Company, The. Vibration damping aircraft engine attachment. 5,065,959, Cl. 244-54.000.

Bialas, Joachim: *See*—
Greil, Andreas; and Bialas, Joachim, 5,066,089, Cl. 385-35.000.

Bianco, James S.; Madsen, James T.; Ceppetelli, Michael; and Fahy, John S., to Control Module Inc. Method and means to limit access to computer systems. 5,067,155, Cl. 380-25.000.

BICC plc.: *See*—
Davey, Rodney J.; Handley, Graham R.; and Ward-Smith, Alfred J., 5,065,928, Cl. 226-7.000.

Bielsteiner Verschlusstechnik GmbH: *See*—
Rosenthal, Karl-Heinz, 5,065,912, Cl. 222-517.000.

Bier, Peter: *See*—
Wehnert, Wolfgang; Reinking, Klaus; Bier, Peter; Kraft, Klaus; and Tresper, Erhard, 5,066,704, Cl. 524-449.000.

Billing, Robert, to Questech Limited. Error-correction of stored television signals. 5,067,133, Cl. 371-53.000.

Billingsley, Henry C.: *See*—
Broughton, George L.; Binversie, Gregory B.; and Billingsley, Henry C., 5,065,723, Cl. 123-413.000.

Bindomatic AB: *See*—
Tholerus, Jan, 5,066,183, Cl. 412-4.000.

Bindon, Glyn A. J., to Trijicon, Inc. Iron sight with illuminated pattern. 5,065,519, Cl. 33-241.000.

Binney & Smith Inc.: *See*—
Kowtko, Robert M.; and Mellwig, Richard A., 5,066,216, Cl. 425-562.000.

Binversie, Gregory B.: *See*—
Broughton, George L.; Binversie, Gregory B.; and Billingsley, Henry C., 5,065,723, Cl. 123-413.000.

Biochemie Gesellschaft m.b.H.: *See*—
Prager, Bernhard C., 5,066,798, Cl. 540-225.000.

Biomedic S.r.l.: *See*—
Negri, Febo R.; and Tomasini, Ercole, 5,066,232, Cl. 433-224.000.

Bissell, Robert D.; and Ortyl, Nicholas E., III, to Dresser Industries, Inc. Method of calibrating mechanical pressure gauges. 5,067,100, Cl. 364-571.010.

Blachley, Gerry B., to Antenna Down Link, Inc. Dual frequency coaxial feed assembly. 5,066,958, Cl. 343-756.000.

Black & Decker Inc.: *See*—
Krasznai, Charles Z.; and Kosten, Richard B., 5,065,473, Cl. 15-339.000.

Blake, Kenneth J.: *See*—
Kennedy, Francis A.; Neff, John P.; and Blake, Kenneth J., 5,066,440, Cl. 264-69.000.

Blakkan, John A., to Tandem Computers Incorporated. One out of N checking apparatus and method. 5,067,132, Cl. 371-52.000.

Blanchard, Frederick W.; and Moore, Thomas J., to SSI Medical Services, Inc. Apparatus for transferring a patient between patient support surfaces. 5,065,464, Cl. 5-81.00R.

Blanco, Agustin R.: *See*—
Cornelissen, Roger E.; Haubach, Claus C. F.; and Blanco, Agustin R., 5,065,868, Cl. 206-494.000.

Blaser, Hans-Ulrich; Jalett, Hans-Peter; and Sedelmeier, Gottfried, to Ciba-Geigy Corporation. Preparation of sulfonic acid esters. 5,066,801, Cl. 540-523.000.

Blatter, Harold: *See*—
Doty, James H., II; Albean, David L.; and Blatter, Harold, 5,066,868, Cl. 307-262.000.

Bliss, Eric M.; and Wunder, William G., Sr., to Nabisco Brands, Inc. Material feed control assembly in a rotary press. 5,066,211, Cl. 425-122.000.

Block, Michael S.; and Hoffman, David R., to Oasis Implants Incorporated. Orthodontic anchor. 5,066,224, Cl. 433-7.000.

Blount, Inc.: *See*—
Smith, Randy L., 5,066,174, Cl. 408-79.000.

Bloys, James B.; and Wilton, Bonsall S., to Atlantic Richfield Company. Control of lost circulation in wells. 5,065,820, Cl. 166-291.000.

Bluff Manufacturing, Inc.: *See*—
Sherrod, Danny G., 5,065,468, Cl. 14-72.500.

Blum, Klaus-Dieter: *See*—
Frigger, Heinz; and Blum, Klaus-Dieter, 5,066,073, Cl. 303-92.000.

Board of Regents University of Texas: *See*—
Saunders, Grady F.; and Mars, Wendy M., 5,066,792, Cl. 536-27.000.

Board of Trustees Operating Michigan State University: *See*—
Putnam, Alan R.; Mishra, Saroj K.; and Nair, Muraleedharan G., 5,066,585, Cl. 424-121.000.

Boatsman, W. Harley, to Gibraltar World International, Ltd. Prefabricated modular building construction system. 5,065,558, Cl. 52-239.000.

Bob's Space Racers, Inc.: *See*—
Dobson, Michael J., 5,066,014, Cl. 273-110.000.

Bobsein, Rex L.: *See*—
Geibel, Jon F.; Bobsein, Rex L.; and Yelton, Harold D., 5,066,774, Cl. 528-388.000.

Bobst SA: *See*—
Yerly, Marcel, 5,065,926, Cl. 225-93.000.

Bodenheimr, Joseph S.: *See*—
Schweitzer, Naftali; Bodenheimr, Joseph S.; and David, Gerald B., 5,066,950, Cl. 340-937.000.

Bodenseewerk Perkin Elmer GmbH: *See*—
Tamm, Rolf; Rodel, Gunther; and Stengele, Erich, 5,066,123, Cl. 356-312.000.
Wulf, Jurgen, 5,066,124, Cl. 356-312.000.

Boehringer Ingelheim International GmbH: *See*—
Reutelingsperger, Christian M., 5,066,788, Cl. 530-381.000.
Reutelingsperger, Christian P. M., 5,066,787, Cl. 530-380.000.

Boeing Company, The: *See*—
Bhatia, Kumar G.; Backus, Walter E.; and Hagelin, Jack S., 5,065,959, Cl. 244-54.000.
Knoll, Frederick L., 5,066,351, Cl. 156-212.000.
Lubowitz, Hyman R.; Sheppard, Clyde H.; and Stephenson, Ronald R., 5,066,541, Cl. 428-378.000.

Bogel, Gerhard, to Stadler AG. Attachment element with large washer. 5,066,181, Cl. 411-383.000.

Boger, Bentley J.; and Jenkins, Thomas C., to Nordson Corporation. Nozzle cap for an adhesive dispenser. 5,065,943, Cl. 239-298.000.

Bombas Auriferas & Equipos Mineros B.A.E M., C.A.: *See*—
Travanti Corinti, Mariano; and Nepi Campitelli, Giovanni, 5,066,193, Cl. 415-201.000.

Bommer, Jerry C.; and Burnham, Bruce F., to Nippon Petrochemicals Company, Ltd. Tetrapyrrole therapeutic agents. 5,066,274, Cl. 604-20.000.

Bonfiglio, Joseph W.: *See*—
Harrold, William J.; Sansone, Joseph A.; Bonfiglio, Joseph W.; and Kim, Seung K., 5,066,891, Cl. 315-8.000.

Bontempo, Donald T. Swimming pool leak detector. 5,065,690, Cl. 116-264.000.

Boothe, Bobby L.; and Godsey, Edward P., to Chesapeake Packaging Company. Sharps container and blank. 5,065,939, Cl. 229-151.000.

Borkenhagen, John M.; Schmierer, Quentin; and Geer, Charles P., to International Business Machines Corporation. System and method for automatically configuring translation of logical addresses to a physical memory address in a computer memory system. 5,067,105, Cl. 395-400.000.

Bortnick, Newman M.; Wanat, Robert A.; and Degraff, Darnel, to Rohm and Haas Company. Polymers stabilized against light and heat degradation. 5,066,696, Cl. 524-91.000.

Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., to Warner-Lambert Co. Triazole derivatives of fenamates as antiinflammatory agents. 5,066,668, Cl. 514-384.000.

Boser, Otmar H.: *See*—
Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, 5,066,544, Cl. 428-614.000.

Boss, Barbara D.: *See*—
Patrick, James W.; Heinemann, Stephen F.; Boss, Barbara D.; and Cowan, W. Maxwell, 5,066,593, Cl. 435-240.270.

Boston Scientific Corporation: *See*—
de Toledo, Fernando A., 5,065,769, Cl. 128-772.000.

Boston University, Trustees of: *See*—
Szabo, Sandor; Rubin, Meryl S. A.; Klibaner, Michael; and Kamarei, Ahmed R., 5,066,496, Cl. 424-570.000.

Bouchard, Andre C.; Lagushenko, Radomir; and Maya, Jakob, to GTE Products Corporation. Glow discharge lamp with incandescent filament. 5,066,892, Cl. 315-46.000.

Boulet, Jean: *See*—
Bardin, Christian; Pignard, Guy; Boulet, Jean; and Morin, Pierre, 5,065,825, Cl. 175-38.000.

Bourdo, John L., to Durashore, Inc. Retaining wall employing fiberglass panels for preventing erosion of a shoreline and method for fabricating the same. 5,066,353, Cl. 156-300.000.

Bourgeois, Norman R.; and Robichaux, Bradley A., to Metal Fusion, Inc. Convertible burner apparatus. 5,065,735, Cl. 126-40.000.

Bouse, James R.: *See*—
DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.

Boutet, John C.; and Unruh, Gary R., to Eastman Kodak Company; and Lumisys. Storage phosphor cassette assembly. 5,065,866, Cl. 206-455.000.

Bowers, Joel A.: *See*—
Rioja, Roberto J.; Bowers, Joel A.; and James, R. Steve, 5,066,342, Cl. 148-12.70A.

Bowman, Wayne A.: *See*—
Osterhoudt, Hans W.; Ponticello, Ignazio S.; Christy, Kenneth G., Jr.; Bowman, Wayne A.; and Eikenberry, Jon N., 5,066,376, Cl. 204-182.800.

Boyle, William J., Jr.: *See*—
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundan M., 5,066,772, Cl. 528-354.000.

Bozetto, Jean-Claude: *See*—
Schuppiser, Jean-Luc; Coutant, Antoine; and Bozetto, Jean-Claude, 5,066,508, Cl. 426-584.000.

BP Chemicals Limited: *See*—
Dumain, Andre; Engel, Jean; and Havas, Laszlo, 5,066,736, Cl. 526-82.000.

BPS Systems, Inc.: *See*—
Takken, Paul E.; Scheckel, Robert G.; and Peo, Steven D., 5,065,469, Cl. 15-89.000.

Bracco Industria Chemica S.p.A.: *See*—
Felder, Ernest; Musu, Carlo; Fumagalli, Luciano; and Uggeri, Fulvio, 5,066,823, Cl. 560-13.000.

Bradley, Edward C.: *See*—
Paradise, Carolyn M.; and Bradley, Edward C., 5,066,489, Cl. 424-85.200.

Brady, David L. Cue ball scratch indicator. 5,066,009, Cl. 273-14.000.

Brady, Michael F.; Dorey, John K., II; and Helms, Aubrey L., Jr., to AT&T Bell Laboratories. Photolithographic processes using thin coatings of refractory metal silicon nitrides as antireflection layers. 5,066,615, Cl. 437-229.000.

Braga, Vittorio; Manica, Michele; Martini, Emilio; and Milani, Federico, to Ausimont S.p.A. Plastoelastomeric polyolefinic compositions and process for preparing them according to dynamic vulcanizable methods. 5,066,700, Cl. 524-380.000.

Braithwaite, Philip W., to Technosystem Limited. Syringes. 5,066,280, Cl. 604-110.000.

Brandenstein, Manfred; and Olschewski, Armin, to SKF GmbH. Means for mounting a bearing ring. 5,066,147, Cl. 384-585.000.

Brandle, Hubert; Schultheis, Lothar; and Ruegg, Walter, to ASEA Brown Boveri Ltd. Connector for an optical cable. 5,066,097, Cl. 385-76.000.

Brandner, Gerhard; and Hoebel, Peter, to Siemens Aktiengesellschaft. Stimulable phosphor radiation image storage screen having an antireflection layer. 5,066,864, Cl. 250-484.100.

Brane, Douglas K.: *See*—
Brane, Earl P.; and Brane, Douglas K., 5,065,901, Cl. 222-20.000.

Brane, Earl P.; and Brane, Douglas K. Apparatus for monitoring a flow of fluid through a filter medium. 5,065,901, Cl. 222-20.000.

Braun, Rainer: *See*—
Riedisser, Gunter; and Braun, Rainer, 5,065,636, Cl. 74-40.000.

Braun, Stephen A.; O'Neill, Michael J.; and Cutshall, Donald L., to Deere & Company. Mower deck height adjustment mechanism. 5,065,568, Cl. 56-14.900.

Brazeau, Paul: *See*—
Cohen, Eric A.; Gaudreau, Pierrette; Michaud, Jacques; Brazeau, Paul; and Langelier, Yves, 5,066,783, Cl. 530-328.000.

Breeden, Robert L.; Johnson, Richard E.; Kabcenell, Amy R.; and Holmes, Thomas F., to Motorola, Inc. Sending different identifiers to selected receivers, to represent the same source. 5,066,949, Cl. 340-825.440.

Brett, William A.; and Zaun, Richard D., to Deere & Company. Cushioned wheel assembly for a sprayer. 5,066,030, Cl. 280-92.000.

Breyer, Karl-Hermann, to Carl-Zeiss-Stiftung. Probing device for a coordinate measuring apparatus. 5,065,526, Cl. 33-702.000.

Bridgestone Corporation: *See*—
Hamada, Tatsuro; Fukuoka, Hiromi; Komatsu, Hideki; and Fujimaki, Tatsuo, 5,066,721, Cl. 525-102.000.
Toyosawa, Shinichi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Kawagoe, Takahiro, 5,066,556, Cl. 429-194.000.

Bridgestone/Firestone, Inc.: *See*—
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., 5,066,729, Cl. 525-315.000.

Brienza, Michael J., to United Technologies Corporation. Extended length embedded Bragg grating manufacturing method and arrangement. 5,066,133, Cl. 359-570.000.

Brieva, Hernando; Jose, Natividad; and Tietjen, Marlene, to Revlon, Inc. Cosmetic compositions comprising oil-in-water emulsion containing pigment. 5,066,485, Cl. 424-63.000.

Briggs, Charles R.; and Neefe, Charles W. Method of making toric contact lenses. 5,066,431, Cl. 264-2.100.

Brighton, Jack E. Fluid flow indicator. 5,065,691, Cl. 116-274.000.

Brill, Edwin W., Jr.: *See*—
Przybylowicz, Catherine S.; Brill, Edwin W., Jr.; and Carrozziere, Luigi A., 5,067,093, Cl. 364-498.000.

Brimeyer, Dennis A.: *See*—
Rudolph, Leroy, Jr.; and Brimeyer, Dennis A., 5,065,646, Cl. 76-101.100.

Brisson, Pierre, to SGS Thomson Microelectronics SA. System for reserving a supply of goods or services. 5,066,853, Cl. 235-381.000.

Bristol-Myers Company: *See*—
Ohnuma, Takeshi; Hoshi, Hideaki; Kamei, Hideo; and Naito, Takayuki, 5,066,645, Cl. 514-27.000.

British Aerospace Public Limited Company: *See*—
Combridge, Brian L.; Robson, David; and Timson, Daniel R. E., 5,067,015, Cl. 358-133.000.

British Petroleum Company, p.l.c., The: *See*—
Ashpitel, William G.; and Parsons, Ralph G. W., 5,065,631, Cl. 73-849.000.

Brixner, Diana I.: *See*—
Sivam, Gowsala P.; Reed, Michael W.; Srinivasan, Ananthachari; Morgan, A. Charles, Jr.; Brixner, Diana I.; Vrudhula, Vivekananda M.; and Comezoglu, F. Taha, 5,066,789, Cl. 530-388.000.

Broadway Companies, Inc.: *See*—
Bartley, Harold D.; and Gaiser, William R., 5,066,081, Cl. 215-1.00C.

Brock, Andrew J.: *See*—
Pasqualoni, Anthony M.; Mahulikar, Deepak; Jalota, Satish K.; and Brock, Andrew J., 5,066,368, Cl. 204-58.000.

Brody, Thomas P. Modular flat-screen television displays and modules and circuit drives therefor. 5,067,021, Cl. 358-241.000.

Broeksteeg, Johannes M., to AMP Incorporated. Impedance matched backplane connector. 5,066,236, Cl. 439-79.000.

Broken Hill Proprietary Company Limited, The: *See*—
Lukey, Christopher A.; Maitra, Ashit M.; and Tyler, Ralph J., 5,066,629, Cl. 502-84.000.

Bron Elektronik AG: *See*—
Bernhard, Jean-Francois, 5,066,121, Cl. 356-218.000.

Brook, Alan R. Tree guard mat. 5,065,543, Cl. 47-25.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hayashi, Kazutoshi, 5,065,683, Cl. 112-292.000.
Kuwabara, Satoru, 5,066,973, Cl. 355-27.000.
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,066,152, Cl. 400-621.000.
Nagata, Osamu; and Makino, Kazumasa, 5,066,972, Cl. 355-27.000.
Nakata, Takashi; and Suzuki, Tauyoshi, 5,066,974, Cl. 355-71.000.
Yamanashi, Motoaki, 5,066,985, Cl. 355-326.000.

Broughton, George L.; Binversie, Gregory B.; and Billingsley, Henry C., to Outboard Marine Corporation. Marine propulsion device with spark timing and fuel supply control mechanism. 5,065,723, Cl. 123-413.000.

Broughton, Timothy C. Ski binding. 5,066,036, Cl. 280-615.000.

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Brown, John H., Jr. Attachment to a portable power planar. 5,066,177, Cl. 409-178.000.

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Barrett, David M.; and Brown, Timothy J., 5,065,805, Cl. 160-23.100.

Bruck, Martin: *See*—
Gerdau, Thomas; Kleiner, Hans-Jerg; Peuckert, Marcellus; Bruck, Martin; and Aldinger, Fritz, 5,066,623, Cl. 501-97.000.

Bruggink, Bradley J.: *See*—
DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.

Brumby, John A., to Ace Conveyor Equipment Limited. Conveyor belt scraper. 5,065,859, Cl. 198-499.000.

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Montagnier, Luc; Chamaret, Solange; Guetard, Denise; Alizon, Marc; Clavel, Francois; Guyader, Mireille; Sonigo, Pierre; Brun-Vezinet, Francoise; Rey, Marianne; Rouzioux, Christine; and Katlama, Christine, 5,066,782, Cl. 530-324.000.

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Buchan, Alexander: *See—*
Skinner, Gordon R. B.; and Buchan, Alexander, 5,066,492, Cl. 424-89.000.

Buckman Laboratories International, Inc.: *See—*
Pera, John D.; Hickman, Loel L.; and Conoway, Lawrence S., 5,066,334, Cl. 106-462.000.

Buckshaw, Dennis J.; and Clark, James A. Corner bumper. 5,065,972, Cl. 248-345.100.

Buerli, Richard, to Minnesota Mining and Manufacturing Company. Optical fault finder using matched and clipping filters. 5,066,118, Cl. 356-73.100.

Buhmann, Ulrich; Joppien, Hartmut; and Baumert, Dietrich, to Schering Aktiengesellschaft. Substituted phenyl acid esters, their preparation and their use as insecticides and acaricides. 5,066,675, Cl. 514-544.000.

Buhr, Gerhard: *See—*
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, 5,066,567, Cl. 430-325.000.

Bulat, Emel S.; and Devlin, Brian T., to GTE Laboratories Incorporated. Method of manufacturing static induction transistors. 5,066,603, Cl. 437-29.000.

Bullis, Stephen J.; Duke, Steven R.; Cozzy, Thomas W.; and Rossier, Glenn E., to General Electric Company. Firing mechanism for revolving battery gun. 5,065,662, Cl. 89-12.000.

Bullock, Donald F., to General Electric Company. Coaxial current sensors. 5,066,904, Cl. 324-127.000.

Bulter Manufacturing Company: *See—*
Evers, David E.; and Milburn, Charles A., 5,065,649, Cl. 81-458.000.

Bunka Shutter Co., Ltd.: *See—*
Kondoh, Kohichi, 5,065,806, Cl. 160-36.000.

Bunnell, Lee R., Sr., to Battelle Memorial Institute. Apparatus for producing thin flakes. 5,065,948, Cl. 241-199.500.

Burgel, Johannes; and Lamarche, Jean L., to I F M Electronic GmbH. Analog to digital converter with reference voltage control and analog style display. 5,066,954, Cl. 341-158.000.

Burnham, Bruce F.: *See—*
Bommer, Jerry C.; and Burnham, Bruce F., 5,066,274, Cl. 604-20.000.

Burt, Peter J.: *See—*
Bergen, James R.; Burt, Peter J.; Hingorani, Rajesh; and Peleg, Shmuel, 5,067,014, Cl. 358-105.000.

Burtner, Lee W.; and Chizmar, David A., to Westinghouse Electric Corp. Apparatus and method for inspecting an item having grooves machined therein. 5,065,635, Cl. 73-866.500.

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Edlund, Roy, 5,066,027, Cl. 277-165.000.

Busato, Murray F.: *See—*
Cook, John E.; and Busato, Murray F., 5,065,575, Cl. 60-290.000.

Busch, Rainer; and Malina, Ludek, to Maschinenfabrik Rieter AG. Thread tube. 5,065,951, Cl. 242-46.210.

Bush, David E., to Bush, David E. Apparatus for loading and unloading open top railroad cars. 5,066,188, Cl. 414-339.000.

Bushman, James B.: *See—*
Kroon, David H.; Goldsmith, Gary; Baach, Miachel K.; and Bushman, James B., 5,065,893, Cl. 220-565.000.

Butina, Darko: *See—*
Oxford, Alexander W.; Coates, Ian H.; and Butina, Darko, 5,066,660, Cl. 514-323.000.

Buttery, Howard J.: *See—*
Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., 5,066,419, Cl. 252-174.110.

Butts, Richard E.; and Davis, John C., to Xerox Corporation. Sheet inverter and stacking apparatus. 5,065,997, Cl. 271-187.000.

B.V. Interlad: *See—*
Longstaff, Eric, 5,066,082, Cl. 359-361.000.

Byczynski, Dean G.; and Reed, William A., to U-Line Corporation. Hot gas bypass defrosting system. 5,065,584, Cl. 62-81.000.

Byles, Michael N., to Guilford Mills, Inc. Textile fabric with opposed absorbent and non-absorbent layers and method of fabricating same. 5,065,600, Cl. 66-193.000.

Byrd, Carl E.; Kelly, Stephen L.; and Beaver, Richard N., to Dow Chemical Company, The. Electrocatalytic cathodes and method of preparation. 5,066,380, Cl. 204-290.00R.

C. M. Offray & Son, Inc.: *See—*
Lee, Richard P.; Ley, Joseph F.; and Mortensen, John A., 5,066,363, Cl. 162-100.000.

Caccia, Giulio; and Baldacci, Massimo, to Laboratori Baldacci SpA. Sulfonamido derivative inhibiting the aldose reductase enzyme system and pharmaceutical compositions containing them. 5,066,676, Cl. 514-562.000.

Cadigan, Lloyd. Swimming pool safety ladder. 5,065,840, Cl. 182-93.000.

Caiozzo, Nicholas: *See—*
Savino, Thomas G.; Balch, Thomas C.; Steinmetz, Alan J.; Balatin, Sergio E.; and Caiozzo, Nicholas, 5,066,732, Cl. 525-440.000.

Cajon Company: *See—*
Weigl, Jeffrey L.; and Babuder, Gerald A., 5,066,051, Cl. 285-328.000.

Cambon, Aime : *See—*
Sismondi, Alain; Abenin, Parfait; and Cambon, Aime , 5,066,672, Cl. 514-513.000.

Cameron, Donald M.: *See—*
Akam, Nigel J.; Cameron, Donald M.; Halliday, David K.; and Paterson, Raymond, 5,065,858, Cl. 198-493.000.

Campagnolo Srl: *See—*
Romano, Antonio, 5,066,264, Cl. 474-152.000.

Campbell, Ian B.: *See—*
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.

Campbell, Richard E., Jr., to Dow Chemical Company, The. Process for preparation of syndiotactic vinyl aromatic polymers. 5,066,741, Cl. 526-171.000.

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Farfaglia, Leonard T., deceased; Campbell, Timothy J.; Gipson, Billy P.; Matambo, Thompson; and Thompson, Christoper M., 5,065,597, Cl. 62-262.000.

Canadian Marconi Co.: *See—*
Lu, Zhuo-Jun, 5,066,128, Cl. 356-349.000.

Candela Laser Corporation: *See—*
Furumoto, Horace, 5,066,293, Cl. 606-9.000.

Canon Kabushiki Kaisha: *See—*
Anzai, Katsuhiko, 5,067,024, Cl. 358-296.000.
Fukuda, Tsuguhiro; Nakagomi, Hiroshi; and Karita, Seiichirou, 5,066,964, Cl. 346-140.00R.
Goto, Masahiro; Inoue, Takahiro; Kato, Junichi; and Kobayashi, Tatsuya, 5,066,979, Cl. 355-208.000.
Hikake, Norio; and Kitamori, Naoto, 5,066,558, Cl. 430-109.000.
Ishii, Satoshi; Tsukiji, Masaaki; Nishimura, Tetsuharu; and Ishizuka, Koh, 5,067,089, Cl. 364-486.000.
Ishii, Yoshiki; and Shimokoriyama, Makoto, 5,067,010, Cl. 358-13.000.
Iwata, Mikio; Kariya, Takao; and Ohtsuka, Masaru, 5,066,131, Cl. 356-401.000.
Kanda, Shigeto, 5,067,118, Cl. 369-44.270.
Kaneko, Yoshiyuki, 5,066,948, Cl. 340-825.690.
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,066,945, Cl. 340-784.000.
Kataoka, Kenichi; Nishimoto, Yoshifumi; Igaki, Masahiko; and Yanagi, Eiichi, 5,065,999, Cl. 271-265.000.
Kimura, Isao; and Hasegawa, Kenji, 5,066,963, Cl. 346-140.00R.
Kodaira, Takanori, 5,066,971, Cl. 354-465.000.
Koike, Atsushi, 5,065,698, Cl. 118-719.000.
Makino, Jun; and Tateoka, Masamichi, 5,066,083, Cl. 359-213.000.
Matsumura, Isao, 5,066,117, Cl. 351-226.000.
Miyake, Nobuyuki, 5,066,988, Cl. 355-245.000.
Omata, Satoshi; Shimizu, Hiroshi; and Yamaguchi, Yoko, 5,067,160, Cl. 382-1.000.
Sasaki, Shosuke; and Kitano, Yasuyuki, 5,065,583, Cl. 62-51.300.
Tsuchida, Shinji, 5,067,125, Cl. 370-79.000.
Tsukiji, Masaaki; Nishimura, Tetsuharu; Ishizuka, Koh; Ishii, Satoshi; and Kubota, Yoichi, 5,066,130, Cl. 356-356.000.
Wakui, Tetsuya, 5,067,033, Cl. 360-70.000.
Yoneda, Kou; and Sawada, Takeshi, 5,065,500, Cl. 29-603.000.
Yoshinaga, Kazuo; Keneko, Shuzo; Kai, Takashi; Isaka, Kazuo; and Ohnishi, Toshikazu, 5,066,107, Cl. 359-45.000.
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,066,883, Cl. 313-309.000.

Cardey, Dale L.: *See—*
Cowan, Louis G.; and Cardey, Dale L., 5,065,654, Cl. 83-255.000.

Cargill, Incorporated: *See—*
Evans, Jeffrey C., 5,066,501, Cl. 426-74.000.
Schmidt, Roger A.; and Swenson, Bryan R., 5,066,690, Cl. 523-423.000.

Carl-Zeiss-Stiftung: *See—*
Breyer, Karl-Hermann, 5,065,526, Cl. 33-702.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Szenger, Franz, 5,065,525, Cl. 33-702.000.

Carlstedt, Richard A.: *See—*
Fong, Ding-Huei R.; and Carlstedt, Richard A., 5,065,874, Cl. 213-31.000.

Carmichael, Kathleen M.: *See—*
Robinette, Susan; Lynch, Anita P.; Hoffend, Thomas R.; Grabowski, Edward F.; and Carmichael, Kathleen M., 5,066,557, Cl. 430-58.000.

Carney, Daniel C.: *See—*
Berkeley, Arnold D.; Bernstein, Alec; and Carney, Daniel C., 5,065,813, Cl. 165-1.000.

Carpenter, Steven P.; Cavinee, James C.; and Krannitz, James J., to Babcock & wilcox Co., The. Spring loaded brake assembly for indexing sootblower. 5,065,472, Cl. 15-317.000.

Carpenter Technology Corporation: *See—*
Harner, Leslie L.; and Frantz, Earl L., 5,066,886, Cl. 313-404.000.
Wanner, Edward A.; and Widge, Sunil, 5,066,458, Cl. 420-586.000.

Carr, Larrey, to Heiden, Gene, a part interest. Car towing apparatus with surge brake. 5,066,034, Cl. 280-428.000.

Carr, Roy D.: *See—*
Sessions, Robert W.; and Carr, Roy D., 5,065,752, Cl. 128-156.000.

Carrell, Michael W.; and Gericke, Stephen H., to Safe Medical Devices, Inc. Protective system for safe disposition of a hypodernic syringe device. 5,066,277, Cl. 604-110.000.

Carrier Corporation: *See—*
Amr, Yehia M.; Fallows, W. Joseph, III; and Hogan, Mark R., 5,066,194, Cl. 415-223.000.
Etemad, Shahrokh; and Fraser, Howard H., Jr., 5,065,550, Cl. 51-317.000.
Shapiro-Baruch, Ian, 5,065,586, Cl. 62-93.000.
Shaw, David N., 5,065,591, Cl. 62-175.000.

Carrozziere, Luigi A.: *See*—
Przybylowicz, Catherine S.; Brill, Edwin W., Jr.; and Carrozziere, Luigi A., 5,067,093, Cl. 364-498.000.
Carter, William R.: *See*—
Ellis, Larry G.; and Carter, William R., 5,065,961, Cl. 244-137.400.
Casey, Jeremiah P.; Lucas, Peter A.; and Vratsanos, Menas S., to Air Products and Chemicals, Inc. Sterically hindered ditertiary butyl bridged di(cyclohexylamines). 5,066,764, Cl. 528-122.000.
Casey, Robert G. Removable or fixed inner ring device for trash receptacle liners. 5,065,891, Cl. 220-404.000.
Casey, William J., III: *See*—
Lawson, Jerry W.; and Casey, William J., III, 5,065,776, Cl. 131-365.000.
Casio Computer Co., Ltd.: *See*—
Uchiyama, Shigeru; and Murata, Yoshiyuki, 5,065,659, Cl. 84-723.000.
Casper, Stephen L., to Micron Technology, Inc. Resistor under wire-bond pad. 5,066,999, Cl. 357-51.000.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,066,745, Cl. 526-240.000.
Cassidy, Patrick E.: *See*—
Wada, Keiichiro; Cassidy, Patrick E.; and Hager, William S., 5,066,765, Cl. 528-185.000.
Castellucci, Nicholas T., to Northrop Corporation. Gap filler for advanced aircraft to reduce radar detectability. 5,065,960, Cl. 244-131.000.
Castolin S.A.: *See*—
Steine, Hans-Theo; and Wasserman, Christopher, 5,066,523, Cl. 427-423.000.
Castrigno, Steven; Rafferty, Scott E.; Nichols, Lawrence R.; and Bemis, Claude, to Davidson Textron Inc. Instrument panel with airbag deployment door. 5,066,037, Cl. 280-732.000.
Castrogiovanni, Anthony; Sandewicz, Robert W.; and Amato, Steven W., to Revlon, Inc. Nail enamels containing glyceryl, glycol or citrate esters. 5,066,484, Cl. 424-61.000.
Catanese, John A., to Westinghouse Electric Corp. Ferrous metal detector for detecting a broken mandrel in a cold pilgering operation. 5,066,913, Cl. 324-226.000.
Caterpillar Inc.: *See*—
Bailey, John M., 5,065,574, Cl. 60-274.000.
Caufield, Craig E., to American Home Products Corporation. Ellagic acid derivatives as phospholipase A_2 inhibitors. 5,066,671, Cl. 514-453.000.
Caulfield, Thomas: *See*—
Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, 5,066,544, Cl. 428-614.000.
Cavailles, Jean A.: *See*—
Angenent, Johannes; and Cavailles, Jean A., 5,066,086, Cl. 385-41.000.
Cavallerano, Alan P.: *See*—
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Cavinee, James C.: *See*—
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CEM Corporation: *See*—
Revesz, Robert N., 5,066,843, Cl. 219-10.55R.
Center for Innovative Technology: *See*—
Glasser, Wolfgang G.; De Oliveira, Willer; Kelley, Stephen S.; and Nieh, Li S., 5,066,790, Cl. 530-502.000.
Center, John L.; Mills, William C., Jr.; and Plaskett, John R., to Frito-Lay, Inc. Method and apparatus for closing bottom end flaps of a carton. 5,066,269, Cl. 493-183.000.
Centercore, Inc.: *See*—
Mitchell, George; and Pelosi, Michael H., III, 5,065,668, Cl. 98-31.500.
Central Glass Company, Limited: *See*—
Nakamachi, Fumihiko; and Umebayashi, Masanori, 5,066,525, Cl. 428-29.000.
Centre International de Recherches Dermatologiques dite CIRD: *See*—
Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, 5,066,427, Cl. 260-413.000.
Ceppetelli, Michael: *See*—
Bianco, James S.; Madsen, James T.; Ceppetelli, Michael; and Fahy, John S., 5,067,155, Cl. 380-25.000.
Cerdonio, Massimo; and Vitale, Stefano, to AERITALIA -Societa Aerospaziale Italiana S.p.A. Gyromagnetic-effect cryogenic gyroscope for detecting angular velocity. 5,066,637, Cl. 501-1.000.
Cerprobe Corporation: *See*—
Tarzwell, John W.; Tarzwell, Patrick J.; Myers, Theodore R.; Hyland, Barry M.; Dahl, John C.; and Eddings, Jack L., 5,066,907, Cl. 324-158.00P.
Cetus Corporation: *See*—
Gyllensten, Ulf B.; and Erlich, Henry A., 5,066,584, Cl. 435-91.000.
Paradise, Carolyn M.; and Bradley, Edward C., 5,066,489, Cl. 424-85.200.
Chalmer, Paul D. Fuel products from wast materials. 5,066,311, Cl. 44-535.000.
Chamaret, Solange: *See*—
Montagnier, Luc; Chamaret, Solange; Guetard, Denise; Alizon, Marc; Clavel, Francois; Guyader, Mireille; Sonigo, Pierre; Brun-Vezinet, Francoise; Rey, Marianne; Rouzioux, Christine; and Katlama, Christine, 5,066,782, Cl. 530-324.000.
Champagne, John M., to Sundstrand Corporation. Hydrodynamic bearing protection system and method. 5,066,197, Cl. 417-18.000.
Champion International Corporation: *See*—
Anderson, Nestor A., 5,065,938, Cl. 229-125.080.
Chan, Huan-Yin. Multi-deck type of rotary shoe rack. 5,065,871, Cl. 211-37.000.
Chan, Ting Y., to Texaco Inc. Liquid degasser in an ebullated bed process. 5,066,467, Cl. 422-140.000.
Chan, Yiu-Fai; Hsiao, Chang-Chia; and Watson, James A., to Altera Corporation. Integrated circuits with reduced switching noise. 5,066,873, Cl. 307-443.000.
Chance, Richard F.: *See*—
Hadcock, Richard N.; Chipman, Richard R.; Horn, Michael; and Chance, Richard F., 5,065,630, Cl. 73-802.000.
Chang, Chan-Ting: *See*—
Liu, Ru-Shi; Wang, Wang-Nang; and Chang, Chan-Ting, 5,066,636, Cl. 505-1.000.
Chang, Maw-Guay. Multiple-purpose fecal examination apparatus. 5,066,463, Cl. 422-56.000.
Chang, Nienyuan J., to Procter & Gamble Co., The. Stable biodegradable fabric softening compositions containing linear alkoxylated alcohols. 5,066,414, Cl. 252-8.800.
Chantry, Peter J.: *See*—
Davies, David K.; Chantry, Peter J.; and Goutzoulis, Anastasios P., 5,066,088, Cl. 385-25.000.
Chapman, Leland D.: *See*—
Whitehead, James L.; and Chapman, Leland D., 5,065,758, Cl. 128-402.000.
Chapman, Lloyd R.: *See*—
Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., 5,066,330, Cl. 106-287.340.
Chapman, Michael W.; Mears, Dana C.; and Edwards, Charles C., to Pfizer Hopsital Products Group, Inc. Apparatus for treating a fracture. 5,066,296, Cl. 606-64.000.
Chapman, Richard L.; and Barb, Lewis E. Tandem axle trailer pin extracter device. 5,065,488, Cl. 29-278.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Hansberry, Mitchell L., 5,065,684, Cl. 112-311.000.
Charng, Cedric S. K., to China Wiper Special Rubber Co., Ltd. Multiple position adapter for mounting wiper-blade assembly on wiper arm. 5,065,474, Cl. 15-250.320.
Chaudhuri, Ratan K.; Haldar, Rama K.; and Gangadharan, Balgopal, to GAF Chemicals Corporation. Bioadhesive composition. 5,066,709, Cl. 524-516.000.
Cheah, Chun-Foong; and Skovmand, Timothy J., to National Semiconductor Corporation. Transient protected isolator output stage. 5,066,901, Cl. 323-267.000.
Chee, Paula P.: *See*—
Jones, Lawrence D.; Frey, Paul T.; Gleason, David D.; Chee, Paula P.; and Slightom, Jerry L., 5,066,587, Cl. 435-172.100.
Cheetham, Eric, to Phoenix Environmental, Ltd. Method and apparatus for making solid waste material environmentally safe using heat. 5,065,680, Cl. 110-342.000.
Chen, Chenson K.; and Tsaur, Bor-Yeu, to Massachusetts Institute of Technology. Capping technique for zone-melting recrystallization of insulated semiconductor films. 5,066,610, Cl. 437-83.000.
Chen, Shieh-Shung T.; and Doss, George, to Merck & Co., Inc. Process for preparation of novel angiotensin II antagonists. 5,066,586, Cl. 435-119.000.
Chern, Geeng-Chuan: *See*—
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Cherukuri, Subraman R.; Raman, Kirschna P.; Wong, Lucy L.; Mansukhani, Gul; and Orama, Angel, to Warner-Lambert Company. Method for preparing pulverized polydextrose which is substantially free of acids and compositions containing same. 5,066,511, Cl. 426-658.000.
Chesapeake Packaging Company: *See*—
Boothe, Bobby L.; and Godsey, Edward P., 5,065,939, Cl. 229-151.000.
Chestnut, Benjamin F.: *See*—
Smith, John W.; and Chestnut, Benjamin F., 5,066,838, Cl. 200-61.890.
Cheung, Steven D., to Union Carbide Industrial Gases Technology Corporation. Gas flow distribution system. 5,065,794, Cl. 137-883.000.
Chevallier, Yvonick, to Rhone-Poulenc Specialites Chimiques. Production of silica colloids. 5,066,420, Cl. 252-313.200.
Chevron Research and Technology Co.: *See*—
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Chiang, Bin Y.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.
Chiang, Chieh-Tseng. Structure of isometric ellipse scale. 5,065,523, Cl. 33-562.000.
Chida, Jun, to Fujitsu Limited. Voltage-mode quasi-resonant dc/dc converter. 5,067,066, Cl. 363-16.000.
Chiesi Farmaceutici S.p.A.: *See*—
Chiesi, Paolo; Servadio, Vittorino; and Razzetti, Roberta, 5,066,652, Cl. 514-235.800.
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Chikazawa, Masaaki: *See*—
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Chilvers, David: *See—*
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China Wiper Special Rubber Co., Ltd.: *See—*
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Chinon Kabushiki Kaisha: *See—*
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Chiou, Herng-Der, to Motorola, Inc. Method for producing semiconductor devices having bulk defects therein. 5,066,359, Cl. 156-651.000.
Chipman, Richard R.: *See—*
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Chiron Corporation: *See—*
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Chiu, Bernard, to Duracraft Corporation. Portable humidifier. 5,067,169, Cl. 392-406.000.
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Chizmar, David A.: *See—*
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Chlebina, Larry E.; Majerus, Norbert; Rambacher, John S.; and Felder, Stephen L., to Goodyear Tire & Rubber Company, The. Tread removal method and apparatus. 5,066,448, Cl. 264-334.000.
Cho, Byung W.: *See—*
Yun, Kyung S.; and Cho, Byung W., 5,066,369, Cl. 204-74.000.
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Blaser, Hans-Ulrich; Jalett, Hans-Peter; and Sedelmeier, Gottfried, 5,066,801, Cl. 540-523.000.
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Zink, Rudolf, 5,066,814, Cl. 548-407.000.
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Albers, Stephen J.; Grimshaw, Michael N.; Peterson, David A.; Pugh, John H.; and Wisbey, Jerry D., 5,066,352, Cl. 156-265.000.
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Stewart, Bob W., 5,066,291, Cl. 606-3.000.
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Kojima, Kiyoaki, 5,066,551, Cl. 428-690.000.
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Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,066,516, Cl. 427-118.000.
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Cloeren, Peter F., to P.C.E. Corp. Dual barrier laminate process. 5,066,443, Cl. 264-171.000.
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Simonet, Benoit; Fabre, Pierre; Laluet, Jacques; and Egraz, Jean-Bernard, 5,066,710, Cl. 524-555.000.
Cocks, Franklin H.: *See—*
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Collins, Roy S., to Trisport Ltd. Studs for footwear. 5,065,534, Cl. 36-134.000.
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Suciu-Foca, Nicole; and King, Donald W., 5,066,581, Cl. 435-7.240.
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Hayes, James K., 5,067,094, Cl. 364-510.000.
Wivagg, Adrian P.; and Martin, Kenneth A., 5,065,490, Cl. 29-402.170.
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Sivam, Gowsala P.; Reed, Michael W.; Srinivasan, Ananthachari; Morgan, A. Charles, Jr.; Brixner, Diana I.; Vrudhula, Vivekananda M.; and Comezoglu, F. Taha, 5,066,789, Cl. 530-388.000.
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Compaq Computer Corporation: *See—*
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Bassett, John A., 5,066,900, Cl. 323-224.000.
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Conder, O. Ray, Jr., 5,065,870, Cl. 211-13.000.
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Conoco Inc.: *See—*
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Ritter, Karl M., 5,065,937, Cl. 229-117.130.
Udell, Theodore H., 5,065,883, Cl. 220-276.000.
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Leiweke, Michael E., 5,065,670, Cl. 99-405.000.
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Continental Plastics, Inc.: *See—*
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Cook, Judith P.: *See—*
Hubbard, Ernest T.; Hollingsworth, Michele D.; Ram, N. V. Raghava; and Cook, Judith P., 5,066,595, Cl. 435-240.450.
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Cooksey, Andrew G.; and Reesing, David L., to Otis Engineering Corp. Running tool. 5,066,060, Cl. 294-86.180.
Coombs, Peter M., to Gradco Systems, Inc. Decurler. 5,066,984, Cl. 355-309.000.
Coons, Andrew M., III: *See—*
Yeh, Ling; Harrelson, Hugh G.; and Coons, Andrew M., III, 5,066,308, Cl. 8-403.000.
Cooper Industries, Inc.: *See—*
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Coppi, Germano: *See—*
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Copytele, Inc.: *See—*
Disanto, Frank J.; and Krusos, Denis A., 5,066,946, Cl. 340-787.000.
Corbin, Stephen S.: *See—*
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.
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Cordis Corporation: *See—*
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Cornelissen, Roger E.; Haubach, Claus C. F.; and Blanco, Agustin R. Package consisting of a paper bag compactly packing compressed flexible articles. 5,065,868, Cl. 206-494.000.
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Corning Incorporated: *See—*
Peters, Donald C.; and Seely, Richard L., 5,066,215, Cl. 425-464.000.
Corning Limited: *See—*
Davey, Rodney J.; Handley, Graham R.; and Ward-Smith, Alfred J., 5,065,928, Cl. 226-7.000.
Corrosion Technology, Inc.: *See—*
Harry, John O.; Verhagen, George; and Small, Rudy E., 5,066,379, Cl. 204-279.000.
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Kroon, David H.; Goldsmith, Gary; Baach, Miachel K.; and Bushman, James B., 5,065,893, Cl. 220-565.000.
Cosmescu, Ioan. Performance tester apparatus for a surgical laser system and method therefor. 5,066,294, Cl. 606-11.000.
Cotter, Patrick J., to TRW Vehicle Safety Systems Inc. Release mechanism. 5,065,954, Cl. 242-107.700.
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Kulkarni, Gurunath H.; Naik, Rajan H.; and Rajappa, Srinivasachari, 5,066,819, Cl. 549-438.000.
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Cowan, Louis G.; and Cardey, Dale L., to W. A. Whitney Corp. Machine for punching and shearing angle iron and flat stock. 5,065,654, Cl. 83-255.000.
Cowan, W. Maxwell: *See—*
Patrick, James W.; Heinemann, Stephen F.; Boss, Barbara D.; and Cowan, W. Maxwell, 5,066,593, Cl. 435-240.270.
Cox, Ernest J. Storage tank cleanout apparatus. 5,065,781, Cl. 137-15.000.
Cox, James E., Jr., to Inamed Corporation. Inflatable cerivical pessary. 5,065,772, Cl. 128-836.000.
Cozzy, Thomas W.: *See—*
Bullis, Stephen J.; Duke, Steven R.; Cozzy, Thomas W.; and Rossier, Glenn E., 5,065,662, Cl. 89-12.000.
Crater, Arthur H.: *See—*
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Creary, Trevor A.: *See—*
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.
Creative Products Resource Associates, Ltd.: *See—*
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Creedon, Richard L., to General Atomics. Prestressed concrete articles. 5,065,795, Cl. 138-176.000.
Creemer, Laura J.: *See—*
Anzeveno, Peter B.; Angell, Paul T.; and Creemer, Laura J., 5,066,807, Cl. 546-183.000.
Creighton, Dean W.; Efstathiou, John D.; and Merboth, John A., to General Mills, Inc. Method of preparing stabilized whole grain flour. 5,066,506, Cl. 426-450.000.
Crellin B.V.: *See—*
Tameris, Hendrikus M., 5,065,671, Cl. 99-456.000.
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, to International Mobile Machine Corporation. Interpolator for varying a signal sampling rate. 5,067,141, Cl. 375-97.000.
Crites, Patrick H.: *See—*
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Cross, David L., to Se Lab Group, Inc. Shutter for animal-watering valve. 5,065,700, Cl. 119-725.000.
Crouse, Ronald J., to Optoswitch, Inc. Optical micro-switch apparatus. 5,066,856, Cl. 250-229.000.
Crow, Stanley G.: *See—*
Reese, D. Dwaine; Sawyer, Roy D.; and Crow, Stanley G., 5,066,199, Cl. 417-63.000.
Crowley, H. W., to Roll Systems, Inc. Method for processing web material. 5,065,992, Cl. 270-39.000.
Crowninshield, Roy D.; and Hori, Roy Y., to Zimmer, Inc. Prosthetic interpositional device/coupler. 5,066,304, Cl. 623-22.000.
Cseh, Georg; Lienhard, Paul; and Wiedemann, Walter, to Ciba-Geigy Corporation. High-molecular weight organic material containing a metal complex pigment based on hydrazone. 5,066,695, Cl. 524-87.000.
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Cucchi Giovanni & C. S. R. L.: *See—*
Cucchi, Giovanni, 5,066,185, Cl. 414-18.000.
Cullen, Joao A. D.: *See—*
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Culligan International Company: *See—*
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Culp, Gordon W., to Rockwell International Corporation. Constant velocity scanning apparatus. 5,066,084, Cl. 359-213.000.
Cumming, J. Stuart. Intraocular lens insertion device. 5,066,297, Cl. 606-107.000.
Cummins Engine Company, Inc.: *See—*
Antonevich, John M.; and Sundeen, John E., 5,066,600, Cl. 436-52.000.
Curran, William V., to American Cyanamid Company. Intermediates for the preparation of aminothiazoloximino cephalosporins. 5,066,799, Cl. 540-226.000.
Currin, Debra L. Commode seat lifting apparatus. 5,065,460, Cl. 4-251.000.
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Cyprien, Guy: *See—*
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Cyr, Patricia A.: *See—*
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D.E.M. Controls of Canada: *See—*
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D'Agnolo, Armando, to Matics Srl. Device to palletize yarn packages. 5,066,190, Cl. 414-799.000.

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Dahlgren, Douglas L., to Allmand Bros. Inc. Shock absorbent bulbholder mounting. 5,067,065, Cl. 362-369.000.

Daifuku Co., Ltd.: *See—*
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Daifuku, Hideharu: *See—*
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Daiichi Pharmaceutical Co., Ltd.: *See—*
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Daikin Industries, Ltd.: *See—*
Omure, Yukio; Fujiwara, Katsuki; Tsuchiya, Tatsumi; Hishida, Satoshi; Noguchi, Masahiro; and Yamamoto, Ikuo, 5,066,410, Cl. 252-68.000.
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Dainippon Screen Mfg. Co., Ltd.: *See—*
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Daley, Lawrence R.; and Leslie, Gerald G., II, to International Business Machines Corp. Pad printing of resist over via holes. 5,066,360, Cl. 156-660.000.

D'Amato, mark, to D.E.M. Controls of Canada. Reinforced spray manifold. 5,065,944, Cl. 239-550.000.

D'Ambra, Thomas E.; and Bell, Malcolm R., to Sterling Drug Inc. 2- and 3-aminomethyl-6-arylcarbonyl-2,3-dihydropyrrolo[1,2,3-de]-1,4-benzoxazines. 5,066,803, Cl. 544-101.000.

Dangl, Wolfgang; Schick, Gerald; Nowack, Reinhard; and Reuber, Gerhard, to Bayerische Motoren Werke Aktiengesellschaft. Motor vehicle rollover bar driving system. 5,066,040, Cl. 280-756.000.

Daniel, Loic: *See—*
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Daniels, Michael J.: *See—*
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Dantani Co., Ltd.: *See—*
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Dany, Franz-Josef; Ulrich, Hannsjorg; and Westermann, Lothar, to Hoechst Aktiengesellschaft. Dishwashing agent. 5,066,415, Cl. 252-135.000.

Darnell, William R.: *See—*
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Darragh, Charles T., to Solar Turbines Incorporated. Sealing system for a circular heat exchanger. 5,065,816, Cl. 165-125.000.

Dart Industries Inc.: *See—*
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Darvin, Richard M., to QNC, Inc. Forced convection oven. 5,066,851, Cl. 219-400.000.

Datta, Madhav: *See—*
Andreshak, Joseph C.; Datta, Madhav; Romankiw, Lubomyr T.; and Vega, Luis F., 5,066,370, Cl. 204-129.100.

Daubenbis, Stanley D.: *See—*
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Daugherty, Charles W.: *See—*
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Daugherty, David W., Jr.: *See—*
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Davey, Rodney J.; Handley, Graham R.; and Ward-Smith, Alfred J., to BICC plc.; and Corning Limited. Method and apparatus for blowing an optical fibre member. 5,065,928, Cl. 226-7.000.

David, Gerald B.: *See—*
Schweitzer, Naftali; Bodenheimr, Joseph S.; and David, Gerald B., 5,066,950, Cl. 340-937.000.

David, Helmut; Malik, J. Ernst; and Schmidt, Rainer, to Man Gutehoffnungshutte Aktiengesellschaft. Force free suspension of heat exchange bundles with high temperature admission flow. 5,065,815, Cl. 165-67.000.

David Sarnoff Research Center, Inc.: *See—*
Bergen, James R.; Burt, Peter J.; Hingorani, Rajesh; and Peleg, Shmuel, 5,067,014, Cl. 358-105.000.

Davidson Textron Inc.: *See—*
Castrigno, Steven; Rafferty, Scott E.; Nichols, Lawrence R.; and Bemis, Claude, 5,066,037, Cl. 280-732.000.

Davies, Anthony R.; Downward, Steven J.; and Chilvers, David, to Smiths Industries public limited company. Valve assemblies and means. 5,065,784, Cl. 137-116.000.

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Davis, John C.: *See—*
Butts, Richard E.; and Davis, John C., 5,065,997, Cl. 271-187.000.

Davis, Robert J.: *See—*
Arthur, James D.; Sanderford, H. Britton, Jr.; Rouquette, Robert E.; and Davis, Robert J., 5,067,136, Cl. 375-1.000.

Davlyn Manufacturing Co.: *See—*
Weil, Thomas L., 5,066,028, Cl. 277-181.000.

Deacon, Walter T.; and Vyve, Albert V., to Armstrong International, Inc. Steam trap with separate steam and condensate inlets. 5,065,785, Cl. 137-185.000.

Dean, William R.; and Waters, John H., to Hitchcox Targets Limited. Thermally-emissive, weaponry target, training aid or arc designator structure. 5,066,019, Cl. 273-348.100.

DeBonte, Lorin R.; and Loh, Willie H. T., to DNA Plant Technology. Method for the manipulation of pollen in plants. 5,066,594, Cl. 435-240.400.

De Bortoli, Giuseppe, to Nordica S.p.A. Fastening and adjusting device, particularly for ski boots. 5,065,480, Cl. 24-68.0SK.

Debroy, Tapan K.: *See—*
Chung, Ding Y.; Debroy, Tapan K.; and Tjoe, Sioe-Heng A., 5,066,688, Cl. 523-415.000.

de Buda, Eric. Piano tuning system. 5,065,660, Cl. 84-200.000.

Decker, Kenneth L., to Otis Engineering Corporation. Gas lift valve. 5,066,198, Cl. 417-54.000.

Deere & Company: *See—*
Braun, Stephen A.; O'Neill, Michael J.; and Cutshall, Donald L., 5,065,568, Cl. 56-14.900.
Brett, William A.; and Zaun, Richard D., 5,066,030, Cl. 280-92.000.
Hadley, Howard C., 5,065,681, Cl. 111-55.000.
Rudolph, Leroy, Jr.; and Brimeyer, Dennis A., 5,065,646, Cl. 76-101.100.
Schlueter, Francis E., 5,065,569, Cl. 56-16.600.

Defalque, Corinne: *See—*
Soria, Raymond; Defalque, Corinne; and Gillot, Jacques, 5,066,398, Cl. 210-321.890.

DeFrank, Michael P.; and Rosati, Robert J., to IVAC Corporation. Protective apparatus for a biomedical probe. 5,066,142, Cl. 374-208.000.

DeGelder, Jacob, to Systems Furniture Company. Chair back and seat adjustment mechanism. 5,066,069, Cl. 297-374.000.

Degraff, Darnel: *See—*
Bortnick, Newman M.; Wanat, Robert A.; and Degraff, Darnel, 5,066,696, Cl. 524-91.000.

deGrassie, John S.: *See—*
Ikezi, Hiroyuki; Lin-Liu, Yuh-Ren; and deGrassie, John S., 5,066,928, Cl. 333-20.000.

Deguchi, Katsuyasu; Mizoguchi, Takatoshi; Taminaga, Takayuki; and Fujii, Akiyoshi, to Sharp. Thermal printing head. 5,066,960, Cl. 346-76.0PH.

Dehlsen, James G. P. Rotary radiating bed thermophotovoltaic process and apparatus. 5,066,339, Cl. 136-253.000.

DeKam, Cornelius T. Soldering iron for surface mounted components. 5,066,849, Cl. 219-233.000.

Dekeyser, Bernard; and Troude, Roland, to Alcatel Cable. Jointing box for optical fiber cables. 5,066,095, Cl. 385-99.000.

Delahanty, Francis T.: *See—*
Stoy, George P.; Delahanty, Francis T.; and Stoy, Vladimir A., 5,066,091, Cl. 385-98.000.

Delat Systems, Incorporated: *See—*
Miller, Ronald E.; and James, Robert L., 5,066,898, Cl. 315-362.000.

Del Corona, Lucio: *See—*
Poli, Stefano; Coppi, Germano; and Del Corona, Lucio, 5,066,644, Cl. 514-19.000.

Dellacroce, Cheryl: *See—*
Hawes, Robert E., Jr.; Dellacroce, Cheryl; Aaldenberg, Eric; and Lynch, James J., 5,066,045, Cl. 281-45.000.

DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, to Westinghouse Electric Corp. Space dividing partition system having an electrical raceway. 5,065,556, Cl. 52-221.000.

De Luca, Raymond F.; and Jespersen, Paul W., to Georgia Pacific Corporation. Variable support for fan-folded paper dispenser. 5,065,895, Cl. 221-54.000.

DeLuca, Robert D.: *See—*
Forbes Jones, Robin M.; Panzera, Carl; and DeLuca, Robert D., 5,066,225, Cl. 433-8.000.

DeLucia, Paul V. Arrow system. 5,066,021, Cl. 273-421.000.

Demers, James P.; and Sulsky, Richard B., to Ortho Pharmaceutical Corporation. Substituted hydroxyureas. 5,066,658, Cl. 514-269.000.

Demirel, Osman S.; and Sanwick, John D. Patent monitoring system. 5,066,943, Cl. 340-573.000.

Deniega, Jose C.; and Failla, Stephen J., to Ethicon, Inc. Safety trocar. 5,066,288, Cl. 604-274.000.

Denker, John S.; Howard, Richard E.; Jackel, Lawrence D.; and LeCun, Yann, to AT&T Bell Laboratories. Hierarchical constrained

automatic learning neural network for character recognition. 5,067,164, Cl. 382-15.000.

Denki Kagaku Kogyo Kabushiki Kaishi: *See—*
Kobayashi, Kazuhiro; Kouguthi, Hifumi; and Hara, Toshio, 5,065,674, Cl. 101-44.000.

DeNora Permelec S.p.A.: *See—*
Meneghini, Giovanni, 5,066,378, Cl. 204-237.000.

Dent, Paul, to Ericsson GE Mobile Communication Holding, Inc. Dual modulus counter for use in a phase locked loop. 5,066,927, Cl. 331-1.00A.

De Oliveira, Willer: *See—*
Glasser, Wolfgang G.; De Oliveira, Willer; Kelley, Stephen S.; and Nieh, Li S., 5,066,790, Cl. 530-502.000.

DeRosa, Thomas F.: *See—*
Migdal, Cyril A.; Shirodkar, Shailaja M.; DeRosa, Thomas F.; and Miller, Edward F., 5,066,412, Cl. 252-54.600.

Deschamps, Jacques: *See—*
Salavin, Serge; Deschamps, Jacques; Gay, Michel; and Specty, Michel, 5,066,890, Cl. 313-585.000.

Desjardin, Warren. Integral tool and clip for vertical support in a container. 5,065,977, Cl. 248-692.000.

Destryker, Elise; and Hannecart, Etienne, to Solvay & Cie (Societe Anonyme). Process for preparing a latex based on polypyrrole and use of this latex to form a conducting film. 5,066,706, Cl. 524-459.000.

de Toledo, Fernando A., to Boston Scientific Corporation. Small diameter guidewires of multi-filar, cross-wound coils. 5,065,769, Cl. 128-772.000.

Detweiler, Charles A.; and Schultz, Richard A., to Lectron Products, Inc. Constant current vacuum regulator. 5,065,979, Cl. 251-129.160.

Deutsch, Marshall E., to J & S Medical Associates, Inc. Process for removing fine particles from a powder. 5,066,387, Cl. 209-5.000.

Deutsche Forschungsanstault Fur Luft- Und Raumfahrt e.V.: *See—*
Dobrzynski, Werner M., 5,066,195, Cl. 416-200.00R.

Develco, Inc.: *See—*
Rorden, Louis H., 5,067,114, Cl. 367-81.000.

DeVirgilio, John J.: *See—*
Narula, Anubhav P. S.; and DeVirgilio, John J., 5,066,639, Cl. 512-13.000.
Narula, Anubhav P. S.; De Virgilio, John J.; and Van Elst, Jan T., 5,066,641, Cl. 512-25.000.

Devlin, Brian T.: *See—*
Bulat, Emel S.; and Devlin, Brian T., 5,066,603, Cl. 437-29.000.

DeVoe, Irving W.; D'Sylva, Olwyn A.; and Fine, David A., to Metanetix, Inc. Removal of contaminants and recovery of metals from waste solutions. 5,066,371, Cl. 204-149.000.

de Vries, Bernhard: *See—*
Begemann, Malcolm J. S.; de Vries, Bernhard; and van der Veen, Johannes S., 5,065,759, Cl. 128-419.0PG.

Dewert, Heribert: *See—*
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Heribert; and Rump, Hanns, 5,066,466, Cl. 422-98.000.

Dewitt, John R.: *See—*
Cooke, Kevin K.; Dewitt, John R.; and McCloskey, John E., 5,067,041, Cl. 361-394.000.

Dhainaut, Alain: *See—*
Regnir, Gilbert; Dhainaut, Alain; Lepagnol, Jean; and Lepagnol, Jean, 5,066,651, Cl. 514-235.500.

Diagen Institute fur molekularbiologische Diagnostik GmbH: *See—*
Rosenbaum, Volker; and Riesner, Detlev, 5,066,377, Cl. 204-182.800.

Diamond, Albert J. Toothbrush. 5,065,470, Cl. 15-106.000.

Diasonics, Inc.: *See—*
Pell, James W., 5,065,761, Cl. 128-660.030.

DiBello, Louis M.: *See—*
Mousseau, Carlton R.; DiBello, Louis M.; and Nicholas, Nicholas J., 5,065,862, Cl. 206-151.000.

Dickakian, Ghazi B., to Exxon Chemical Patents, Inc. Method of characterizing the effectiveness of baseoil additives. 5,066,598, Cl. 436-2.000.

Dicks, Lori A.: *See—*
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,066,614, Cl. 437-209.000.

DiCosimo, Robert: *See—*
Suresh, Dev D.; DiCosimo, Robert; Loiseau, Richard; Friedrich, Maria S.; and Szabo, Hsiao-Chiung, 5,066,809, Cl. 546-250.000.

Diehm, Martin R. Device for pulling boots on with handle and clamp. 5,065,917, Cl. 223-113.000.

Diesel Kiki Co., Ltd.: *See—*
Kono, Hiromi; and Ohtsuka, Masuhiro, 5,065,849, Cl. 192-0.076.

Dietrich, Ralf: *See—*
Mayerhofer, Franz; Karstensen, Holger; Dietrich, Ralf; and Spaeth, Werner, 5,066,090, Cl. 385-35.000.

DiFrank, Frank J., to Owens-Illinois Plastic Products Inc. Method and apparatus for applying carriers to containers. 5,065,565, Cl. 53-398.000.

Digital Equipment Corporation: *See—*
Fite, Elaine H.; Fossum, Tryggve; Grundmann, William R.; McKeen, Francis X.; and Salett, Ronald M., 5,067,069, Cl. 395-375.000.
Marshall, Donald E.; and McElroy, James B., 5,067,004, Cl. 357-71.000.

Digital Instruments, Inc.: *See—*
Elings, Virgil B.; and Gurley, John A., 5,066,858, Cl. 250-307.000.

Dijkmans, Eise C.: *See—*
Van Rens, Antonia C.; Dijkmans, Eise C.; and Stikvoort, Eduard F., 5,067,138, Cl. 375-81.000.

Dillon, Joseph E.; and Dillon, Mark E., to Tetratec Corporation. Microporous waterproof and moisture vapor permeable structures, processes of manufacture and useful articles thereof. 5,066,683, Cl. 521-54.000.

Dillon, Mark E.: *See—*
Dillon, Joseph E.; and Dillon, Mark E., 5,066,683, Cl. 521-54.000.

DiPerna, Thomas C.: *See—*
O'Rell, Dennis; Hamed, Parviz; and DiPerna, Thomas C., 5,066,537, Cl. 428-246.000.

Disanto, Frank J.; and Krusos, Denis A., to Copytele, Inc. Electrophoretic display panel with selective line erasure. 5,066,946, Cl. 340-787.000.

Dischler, Helmut, to Novopress GmbH, KG. Press for pressing of casings, cable shoes or similar items. 5,065,609, Cl. 72-453.150.

DiStefano, Salvador: *See—*
Nagasubramanian, Ganesan; DiStefano, Salvador; and Liang, Ranty H., 5,066,748, Cl. 526-258.000.

Dixon, David S.; and Masi, James V., to United States of America, Navy. Composite material for EMI/EMP hardening protection in marine environments. 5,066,424, Cl. 252-518.000.

DMV Campina B.V.: *See—*
van den Hoven, Martinus M. G. M.; and Ermens, Hermanus W. A., 5,066,509, Cl. 426-592.000.

DNA Plant Technology: *See—*
DeBonte, Lorin R.; and Loh, Willie H. T., 5,066,594, Cl. 435-240.400.

DNA Plant Technology Corporation: *See—*
Morrison, Robert A.; and Evans, David A., 5,066,830, Cl. 800-230.000.

Dobbelstein, Arnold: *See—*
Hille, Hans-Dieter; and Dobbelstein, Arnold, 5,066,759, Cl. 528-60.000.

Dobrzynski, Werner M., to Deutsche Forschungsanstault Fur Luft- Und Raumfahrt e.V. Propeller for aircraft or the like. 5,066,195, Cl. 416-200.00R.

Dobson, Michael J., to Bob's Space Racers, Inc. Sidewinder amusement game. 5,066,014, Cl. 273-110.000.

Dr. Johannes Heidenhain GmbH: *See—*
Lengenfelder, Hans; and Wasthuber, Robert, 5,066,953, Cl. 341-155.000.

Dohse, Hans-Peter; and Kramer, Jochen, to Stihl, Andreas. Handle arrangement for a handheld portable tool. 5,065,476, Cl. 16-114.00R.

Doi, Kazuhiro; Fujiwara, Yasuhiko; Abe, Toshiro; and Matsui, Shinichi, to Nissan Motor Co., Ltd. Electronically controllable vibration damping device. 5,065,869, Cl. 207-140.100.

Doi, Yoshiharu; Ueki, Satoshi; and Furuhashi, Hiroyuki, to Tonen Corporation. Narrow molecular weight distribution hydrocarbon soluble homopolymer of 1,4-pentadiene. 5,066,754, Cl. 526-336.000.

Dolan, Francis P. Portable multi-surface track. 5,066,000, Cl. 272-70.000.

Domon, Masayuki: *See—*
Kaneko, Aijiro; and Domon, Masayuki, 5,065,528, Cl. 34-93.000.

Domon, Taisuke: *See—*
Nakagawa, Shiro; Domon, Taisuke; Imai, Takehiro; and Tsuchida, Atsuko, 5,065,625, Cl. 73-336.500.

Donaldson Company, Inc.: *See—*
Rocklitz, Gary J.; Crofoot, Douglas G.; and Zelinka, Richard L., 5,066,400, Cl. 210-493.500.

Donnelly Corporation: *See—*
Kane, Edmund J.; and Koops, Roger L., 5,065,545, Cl. 49-375.000.
Lynam, Niall R.; and Gahan, Richard J., 5,066,112, Cl. 359-267.000.

Doorenbos, Daryl E. Pressure-regulated bandage applicator. 5,065,865, Cl. 206-409.000.

Dorey, John K., II: *See—*
Brady, Michael F.; Dorey, John K., II; and Helms, Aubrey L., Jr., 5,066,615, Cl. 437-229.000.

Dorf, Ernst-Ulrich; Keinking, Klaus; Jakob, Wolfgang; Tresper, Erhard; and Russeler, Wolfgang, to Bayer Aktiengesellschaft. Copoly arylene/alkylene sulfide. 5,066,775, Cl. 528-388.000.

Dorf, Ernst-Ulrich: *See—*
Russeler, Wolfgang; Idel, Karsten-Josef; Dorf, Ernst-Ulrich; Alewelt, Wolfgang; and Freitag, Dieter, 5,066,776, Cl. 528-388.000.

Dorgan, Roderick J.; and Macaulay, Graham S., to Beecham Group p.l.c. Macrolide derivatives with parasiticidal activity. 5,066,670, Cl. 514-450.000.

Dorschel, Klaus: *See—*
Muller, Gerhard; Kar, Hasan; Dorschel, Klaus; and Schonborn, Karl-Heinz, 5,066,292, Cl. 606-7.000.

Doss, George: *See—*
Chen, Shieh-Shung T.; and Doss, George, 5,066,586, Cl. 435-119.000.

Dotrong, My: *See—*
Evers, Robert C.; and Dotrong, My, 5,066,769, Cl. 528-337.000.

Doty, James H., II; Albean, David L.; and Blatter, Harold, to Thomson Consumer Electronics, Inc. Apparatus for generating phase shifted clock signals. 5,066,868, Cl. 307-262.000.

Doundoulakis, George J.; and Doundoulakis, James H. Saliva ejector. 5,066,228, Cl. 433-91.000.

Doundoulakis, James H.: *See—*
Doundoulakis, George J.; and Doundoulakis, James H., 5,066,228, Cl. 433-91.000.

Dow Chemical Company, The: *See—*
Byrd, Carl E.; Kelly, Stephen L.; and Beaver, Richard N., 5,066,380, Cl. 204-290.00R.
Campbell, Richard E., Jr., 5,066,741, Cl. 526-171.000.

Clement, Katherine S.; Babb, David A.; and Ezzell, Bobby R., 5,066,746, Cl. 526-242.000.
Hefner, Robert E., Jr.; Puckett, Paul M.; and Earls, Jimmy D., 5,066,750, Cl. 526-273.000.
Nader, Bassam S., 5,066,409, Cl. 252-48.200.
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 5,066,478, Cl. 424-1.100.
Tabor, icky L.; and Allen, James A., 5,066,542, Cl. 428-461.000.
Walker, Louis L.; and Larson, Paul A., 5,066,735, Cl. 525-482.000.

Dow Corning Corporation: *See—*
Freiberg, Alan L.; Lefler, Harold V., III; and Liles, Donald T., 5,066,520, Cl. 427-379.000.
Lee, Chi-Long; and Yeh, Ming-Hsiung, 5,066,699, Cl. 524-379.000.

Dowbenko, Rostyslaw: *See—*
Martz, Jonathan T.; Kelly, Thomas W.; Dowbenko, Rostyslaw; Meier, James A.; and Palermo, Anthony C., 5,066,733, Cl. 525-455.000.

DowBrands Inc.: *See—*
Behr, R. Douglas, 5,066,444, Cl. 264-171.000.

Downward, Steven J.: *See—*
Davies, Anthony R.; Downward, Steven J.; and Chilvers, David, 5,065,784, Cl. 137-116.000.

Doye, Dennis L.; and Sneed, Michael R., to AMP Incorporated. Coaxial subminiature connector. 5,066,249, Cl. 439-585.000.

Draftex Industries Limited: *See—*
Goedderz, Dieter, 5,065,486, Cl. 29-235.000.

Dragerwerk: *See—*
Steen, Hans-Wilhelm, 5,065,746, Cl. 128-205.240.

Dragerwerk Aktiengesellschaft: *See—*
Albarda, Scato; Thoren, Werner; Kahning, Stefan; and Vehrens, Peter, 5,065,978, Cl. 251-129.060.

Dragisic, Branislav M.; and Markley, Finley W. Shielding to protect material from laser light. 5,065,757, Cl. 128-207.140.

Drake, David E.: *See—*
Meyers, John A.; Drake, David E.; and Witt, Charles W., 5,065,827, Cl. 175-414.000.

Draper Corporation: *See—*
Roach, Ernest F.; Frick, Stephen D.; and Sample, Randell F., 5,065,796, Cl. 139-300.000.

Drent, Eit: *See—*
Van Deursen, Josephus H.; Van Doorn, Johannes A.; Drent, Eit; and Wong, Pui K., 5,066,778, Cl. 528-392.000.

Dresser Industries, Inc.: *See—*
Bissell, Robert D.; and Ortyl, Nicholas E., III, 5,067,100, Cl. 364-571.010.

Driscoll, Edward C., Jr.; Martin, Craig O.; Ruby, Kenneth; Russell, James J.; and Watson, John G., to Identix Incorporated. Method and apparatus for verifying identity using image correlation. 5,067,162, Cl. 382-5.000.

Driska, John J., to Azrak-Hamway International Inc. Basket for basketball-type game. 5,066,006, Cl. 273-1.50R.

Driver, Michael J.; Greenlees, Alexander R.; and MacPherson, David T., to Beecham Group p.l.c. Amphotericin derivatives. 5,066,646, Cl. 514-31.000.

Driver Safety Systems Ltd.: *See—*
Schweitzer, Naftali; Bodenheimr, Joseph S.; and David, Gerald B., 5,066,950, Cl. 340-937.000.

Droegemueller, Karsten; and Klement, Ekkehard, to Siemens Aktiengesellschaft. Optical arrangement for a feedback-free coupling of a laser emission emitted by a semiconductor laser into an optical fiber. 5,066,092, Cl. 385-33.000.

Drummond, George S.: *See—*
Kappas, Attallah; and Drummond, George S., 5,066,650, Cl. 514-185.000.

D'Sylva, Olwyn A.: *See—*
DeVoe, Irving W.; D'Sylva, Olwyn A.; and Fine, David A., 5,066,371, Cl. 204-149.000.

Du Castel, Francois. Very large size display screen. 5,066,947, Cl. 340-815.310.

Dudley, Kevin F.; Dunshee, Kevin B.; and Abbott, Alan D., to Electric Power Research Institute, Inc. Method for controlling indoor coil freeze-up of heat pumps and air conditioners. 5,065,593, Cl. 62-182.000.

Duke, Steven R.: *See—*
Bullis, Stephen J.; Duke, Steven R.; Cozzy, Thomas W.; and Rossier, Glenn E., 5,065,662, Cl. 89-12.000.

Dulebohn, David H., to Andrew Tool Company. Disassemblable scissors means. 5,065,516, Cl. 30-245.000.

Dumain, Andre; Engel, Jean; and Havas, Laszlo, to BP Chemicals Limited. Gas-phase alpha-olefin polymerization process in the presence of an activity retarder. 5,066,736, Cl. 526-82.000.

Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., to Honeywell Inc. Method of manufacturing a leadframe having conductive elements preformed with solder bumps. 5,066,614, Cl. 437-209.000.

Dunaway, Thomas J.: *See—*
Spielberger, Richard K.; and Dunaway, Thomas J., 5,066,831, Cl. 174-52.400.

Dunbar, Frank C.: *See—*
Kilbane, Farrell M.; Coleman, Richard A.; Dunbar, Frank C.; and Gibson, Alan F., 5,066,549, Cl. 428-653.000.

Dunlap, Beth E.; Rogers, Fulton F., Jr.; and Teasley, Mark F., to Du Pont de Nemours, E. I., and Company. Recovery and melt extrusion of aromatic/aliphatic copolyamides from lactam-plasticized polymer. 5,066,445, Cl. 264-176.100.

Dunshee, Kevin B.: *See—*
Dudley, Kevin F.; Dunshee, Kevin B.; and Abbott, Alan D., 5,065,593, Cl. 62-182.000.

Duphar International Research B.V.: *See—*
Hamminga, Derk; van Wijngaarden, Ineke; and Jansen, Johannes W. C. M., 5,066,649, Cl. 514-183.000.

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Chung, Ding Y.; Debroy, Tapan K.; and Tjoe, Sioe-Heng A., 5,066,688, Cl. 523-415.000.
Dunlap, Beth E.; Rogers, Fulton F., Jr.; and Teasley, Mark F., 5,066,445, Cl. 264-176.100.
Ferretti, August; and Gier, Thurman E., 5,066,356, Cl. 156-623.00R.
Gutowski, Timothy G.; Sentovich, Michael F.; and Okine, Richard K., 5,066,442, Cl. 264-154.000.
Hazan, Isidor; and Nordstrom, John D., 5,066,698, Cl. 524-269.000.
Knox, Benjamin H.; and Noe, James B., 5,066,447, Cl. 264-290.500.
Matthews, Abraham, 5,066,430, Cl. 264-8.000.
Merchant, Abid N., 5,066,417, Cl. 252-171.000.
Merchant, Abid N., 5,066,418, Cl. 252-172.000.
Thelissen, Guillaume Francois G., 5,066,931, Cl. 333-182.000.

Duracraft Corporation: *See—*
Chiu, Bernard, 5,067,169, Cl. 392-406.000.

Durashore, Inc.: *See—*
Bourdo, John L., 5,066,353, Cl. 156-300.000.

Durfee, David, to Durfee, Susan M. Vise jaw accessory system for attaching and releasing vise accessories while maintaining positional accuracy of the accessories. 5,065,990, Cl. 269-282.000.

Durfee, Susan M.: *See—*
Durfee, David, 5,065,990, Cl. 269-282.000.

Durr, Heinrich; Rosenthal, Manfred; and Adamek, Manfred, to U.S. Philips Corporation. Device comprising a printing mechanism. 5,066,151, Cl. 400-605.000.

Dustcontrol International AB: *See—*
Haberl, Johann; and Lundqvist, Gosta, 5,066,315, Cl. 55-96.000.

Dutta, Binay K.; and Sikdar, Subhas K., to United States of America, Commerce. Process for separating azeotropic or close-boiling mixtures by use of a composite membrane, the membrane, and its process of manufacture. 5,066,403, Cl. 210-638.000.

DXImaging: *See—*
Houle, William A.; Larson, James R.; and Pearlstine, Kathryn A., 5,066,821, Cl. 430-137.000.

Dykstra, Douglas L.; and Herbruck, Steven L. Flashing light ball. 5,066,011, Cl. 273-58.00G.

E. R. Squibb & Sons, Inc.: *See—*
Ogletree, Martin L.; Schumacher, William A.; Grover, Gary J.; and Friedhoff, Lawrence T., 5,066,480, Cl. 424-10.000.

Eales, George E. Confection and safety support handle. 5,066,502, Cl. 426-75.000.

Earlam, Sandra J. K.: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.

Earls, Jimmy D.: *See—*
Hefner, Robert E., Jr.; Puckett, Paul M.; and Earls, Jimmy D., 5,066,750, Cl. 526-273.000.

Earnheart, William G., Jr., to Cooper Tire and Rubber Co. Automatic white sidewall spraying apparatus. 5,065,694, Cl. 118-669.000.

Eastman Kodak Company: *See—*
Baxter, Dennis E.; and Stoneham, Jeffrey R., 5,065,952, Cl. 242-71.100.
Boutet, John C.; and Unruh, Gary R., 5,065,866, Cl. 206-455.000.
Erhardt, Herbert J., 5,066,994, Cl. 357-24.000.
Estelle, Lee R.; and Short, Svetlana Z., 5,067,067, Cl. 364-156.000.
Funston, David L., 5,067,020, Cl. 358-214.000.
Hamann, J. Eric, 5,067,092, Cl. 364-496.000.
Hills, Robert G., 5,066,241, Cl. 439-260.000.
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Kalyandurg, Satyan R., 5,066,981, Cl. 355-245.000.
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Pazda, Robert J.; Clum, Kenneth L.; and Hood, Harrison P., III, 5,066,918, Cl. 324-452.000.
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Clarey, Robert J.; and Reiner, Richard A., 5,066,832, Cl. 174-50.000.
Nellums, Richard A., 5,065,855, Cl. 192-53.00E.
Stephenson, Dwight B.; and Marks, Dennis R., 5,065,793, Cl. 137-625.240.

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Ebihara, Yasuhiro; Sakaniwa, Hiroyuki; and Saito, Hiroshi, to Nissan Motor Company, Ltd. Method of securing fastener. 5,065,494, Cl. 29-525.200.

Eckerle, Joseph S.; and Kornbluh, Roy, to Colin Electronics Co., Ltd. Compensation for tonometer sensor crosstalk and element spacing. 5,065,765, Cl. 128-672.000.

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Tarzwell, John W.; Tarzwell, Patrick J.; Myers, Theodore R.; Hyland, Barry M.; Dahl, John C.; and Eddings, Jack L., 5,066,907, Cl. 324-158.00P.

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Edlund, Roy, to Busak + Luyken GmbH & Co. Sealing ring apparatus. 5,066,027, Cl. 277-165.000.

Edo Corporation: *See*—
Lukez, Rudy, 5,065,892, Cl. 220-465.000.

Edwards, Charles C.: *See*—
Chapman, Michael W.; Mears, Dana C.; and Edwards, Charles C., 5,066,296, Cl. 606-64.000.

Edwards, Geoffrey S., to Oxley Developments Company Limited. Sealed LED lamp housing. 5,066,889, Cl. 313-512.000.

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Grubbs, Robert E.; Haberkern, Richard G.; Edwards, Michael E.; and Frederickson, James D., 5,065,774, Cl. 131-291.000.

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Creighton, Dean W.; Efstathiou, John D.; and Merboth, John A., 5,066,506, Cl. 426-450.000.

Egbert, Gary L.; and Ziegler III, Philip L., to Baroid Technology, Inc. Drill string compensator with improved transloaders. 5,066,059, Cl. 294-82.160.

Egerton, Michael: *See*—
Wall, Alan; Grayson, Peter; and Egerton, Michael, 5,066,162, Cl. 403-361.000.

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Eguchi, Yoshio: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.

Ehrenfreund, Josef; and Stamm, Erich, to Ciba-Geigy Corporation. Thioxotetrazolines and insecticidal use thereof. 5,066,667, Cl. 514-381.000.

Ehrman, Albert M.; Seiden, Paul; Weitzel, Rose M.; and White, Robert L., to Procter & Gamble Company, The. Process for tempering flavored confectionery compositions containing reduced calorie fats and resulting tempered products. 5,066,510, Cl. 426-607.000.

Eichenauer, Herbert; Wittmann, Dieter; Schmidt, Adolf; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Thermoplastic moulding compounds based on aromatic polycarbonates and vinyl polymers with improved thermostability. 5,066,717, Cl. 525-67.000.

Eichengerger, Hansulrich; and Clement, Heinz, to Rieter Machine Works, Ltd. Calendar rollers with rounded teeth for crimping sliver and increasing cohension length. 5,065,477, Cl. 19-150.000.

Eichler, Klaus: *See*—
Roscher, Gunter; Schmidt, Karl-Heinz; Eichler, Klaus; Horstermann, Peter; Gradl, Reinhard; and Langner, Horst, 5,066,365, Cl. 203-042.000.

Eikenberry, Jon N.: *See*—
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Richter, Karl-Heinz; Rollmann, Gerhard; Struck, Helmut; and Eilert, Gerd, 5,065,835, Cl. 180-197.000.

Eimori, Takahisa; Satoh, Shinichi; Wakamiya, Wataru; Ozaki, Hiroji; and Tanaka, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having field shield isolation. 5,067,000, Cl. 357-53.000.

Einhaus, Hermanus F., to U.S. Philips Corporation. Disc-record player comprising a disc-loading device for a disc supported on a tray. 5,067,121, Cl. 369-75.200.

Einwiller, Andreas: *See*—
Angel, Maximilian; and Einwiller, Andreas, 5,066,715, Cl. 524-812.000.

Eisai Co., Ltd.: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Eisenstein, Gabe L., to Hewlett-Packard Company. Method and apparatus for displaying and editing mathematical expressions in textbook format. 5,067,102, Cl. 364-709.120.

Electric Power Research Institute, Inc.: *See*—
Dudley, Kevin F.; Dunshee, Kevin B.; and Abbott, Alan D., 5,065,593, Cl. 62-182.000.
Lee, Robert A. S., 5,065,703, Cl. 122-382.000.

Elings, Virgil B.; and Gurley, John A., to Digital Instruments, Inc. Scanning tunneling microscopes with correction for coupling effects. 5,066,858, Cl. 250-307.000.

Elliott, Bernard. Portable convertible barbeque grill. 5,065,734, Cl. 126-9.00R.

Elliott, David L.: *See*—
Leighton, John C.; Iovine, Carmine P.; Aronson, Michael P.; and Elliott, David L., 5,066,749, Cl. 526-271.000.

Ellis, Larry G.; and Carter, William R., to Teleflex Incorporated. Ordnance ejector system for an aircraft. 5,065,961, Cl. 244-137.400.

Elmasry, Mohamed A.; and Kidnie, Kevin M., to Minnesota Mining and Manufacturing Company. Liquid electrophotographic toner. 5,066,559, Cl. 430-111.000.

Elsbett, Gunter: *See*—
Elsbett, Ludwig; Elsbett, Gunter; and Elsbett, Klaus, 5,065,707, Cl. 123-41.420.

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Elton, Richard K.; and Schultz, William R., Jr., to General Electric Company. Semi-conducting layer for insulated electrical conductors. 5,066,881, Cl. 310-213.000.

Elton, Richard K.; and Schultz, William R., Jr., to General Electric Company. Electric charge bleed-off structure using pyrolyzed glass fiber. 5,067,046, Cl. 361-220.000.

Elyanow, Irving D.: *See*—
Parsi, Edgardo J.; Sims, Keith J.; Elyanow, Irving D.; and Prato, Thomas A., 5,066,375, Cl. 204-182.400.

Emerson Electric Co.: *See*—
Lloyd, Jerry D.; and Hilal, M. A., 5,066,638, Cl. 505-1.000.
Slocum, Laurence S., 5,066,944, Cl. 340-603.000.

Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, to Pirelli General plc. Electrical cable manufacture. 5,066,516, Cl. 427-118.000.

Emhart Industries, Inc.: *See*—
Smith, John W.; and Chestnut, Benjamin F., 5,066,838, Cl. 200-61.890.

Emori, Kiyoshi; and Maekawa, Hiroshi, to Minolta Camera Kabushiki Kaisha. Image recording system for controlling developing devices. 5,066,986, Cl. 355-326.000.

Encore Computer Corporation: *See*—
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.

Encore Molding Systems, Inc.: *See*—
Baxi, Indra R.; and Erikson, Erik E., 5,066,214, Cl. 425-190.000.

Endo, Mitsuharu: *See*—
Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, 5,066,982, Cl. 355-269.000.

Endo, Takeshi: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.

Energy Resources & Logistics, Inc.: *See*—
Jenkins, Christopher P., 5,065,581, Cl. 60-668.000.

Engel, Jean: *See*—
Dumain, Andre; Engel, Jean; and Havas, Laszlo, 5,066,736, Cl. 526-82.000.

Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, to Cassella Aktiengesellschaft. Alkenylphosphonic and —phosphinic acid esters, process for their preparation, hydrogels produced using them, and their use. 5,066,745, Cl. 526-240.000.

Engineered Air Systems, Inc.: *See*—
Mutchler, Paul A., 5,065,736, Cl. 126-110.00B.

English, Philip H.; and Szpak, Anthony D. Toothbrush and paste dispenser. 5,066,155, Cl. 401-175.000.

Enterovax Limited: *See*—
Manning, Paul A.; Reeves, Peter R.; and Rowley, Derrick, 5,066,596, Cl. 435-252.330.

Environmental Water Technology, Inc.: *See*—
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,065,791, Cl. 137-515.000.

Eppig, Christopher P.: *See*—
Paspek, Stephen C.; and Eppig, Christopher P., 5,066,386, Cl. 208-187.000.

Erbamont, Inc.: *See*—
Palepu, Nageswara R.; and Hutt, Julie A., 5,066,647, Cl. 514-110.000.

Erhardt, Herbert J., to Eastman Kodak Company. Image sensor. 5,066,994, Cl. 357-24.000.

Ericsson GE Mobile Communication Holding, Inc.: *See*—
Dent, Paul, 5,066,927, Cl. 331-1.00A.

Eriguchi, Hideki: *See*—
Kumakura, Toshihisa; Nanaumi, Ken; Ikezawa, Ryoichi; and Eriguchi, Hideki, 5,066,691, Cl. 523-438.000.

Erikson, Erik E.: *See*—
Baxi, Indra R.; and Erikson, Erik E., 5,066,214, Cl. 425-190.000.

Erlich, Henry A.: *See*—
Gyllensten, Ulf B.; and Erlich, Henry A., 5,066,584, Cl. 435-91.000.

Ermens, Hermanus W. A.: *See—*
van den Hoven, Martinus M. G. M.; and Ermens, Hermanus W. A., 5,066,509, Cl. 426-592.000.

Ernst, Alfons, to Johannes Heidenheim GmbH. Incremental angle encoder having spiral scanning field and multiple discs. 5,066,857, Cl. 250-231.150.

Erowa AG: *See—*
Schneider, Rudolf, 5,065,991, Cl. 269-309.000.

Erwin Kayser - Threde GmbH: *See—*
Rippel, Harald, 5,066,990, Cl. 356-346.000.

Esco Corporation: *See—*
Ottestad, Jack B., 5,065,824, Cl. 173-134.000.

Eslinger, David M., to Halliburton Company. Back pressure regulating valve for ultra high pressures. 5,065,789, Cl. 137-513.500.

Esselte Pendaflex Corporation: *See—*
Hawes, Robert E., Jr.; Dellacroce, Cheryl; Aaldenberg, Eric; and Lynch, James J., 5,066,045, Cl. 281-45.000.

Essilor International, Cie Generale d'Optique: *See—*
Bertrand, Patrick, 5,066,119, Cl. 356-124.000.
Bertrand, Patrick, 5,066,120, Cl. 356-124.000.

Etablissements Proteor: *See—*
Palfray, Michel, 5,065,770, Cl. 128-774.000.

Estelle, Lee R.; and Short, Svetlana Z., to Eastman Kodak Company. Method for evaluating and designing lenses. 5,067,067, Cl. 364-156.000.

Etablissements Marius Millet & Cie: *See—*
Chollet, Jean-Louis, 5,065,914, Cl. 222-529.000.

Etemad, Shahrokh; and Fraser, Howard H., Jr., to Carrier Corporation. Lapping of involute spiral scroll element. 5,065,550, Cl. 51-317.000.

Ethicon, Inc.: *See—*
Deniega, Jose C.; and Failla, Stephen J., 5,066,288, Cl. 604-274.000.
Schulze, Dale R.; Sherman, Jon A.; and Mereness, W. Michael, 5,065,929, Cl. 227-19.000.

Ethyl Corporation: *See—*
Sangokoya, Samuel A.; Howie, Milham S.; and Trumbo, Todd A., 5,066,631, Cl. 502-152.000.

Evans, David A.: *See—*
Morrison, Robert A.; and Evans, David A., 5,066,830, Cl. 800-230.000.

Evans, Jeffrey C., to Cargill, Incorporated. Fluidization of soapstock. 5,066,501, Cl. 426-74.000.

Evans, Robert L., to University of British Columbia, The. Squish jet combustion chamber. 5,065,715, Cl. 123-263.000.

Evans, Timothy G.; Gould, Mark W.; and McNamara, Timothy J., to International Business Machines Corp. Service processor tester. 5,067,129, Cl. 371-16.100.

Evers, David E.; and Milburn, Charles A., to Bulter Manufacturing Company. Device for holding fasteners. 5,065,649, Cl. 81-458.000.

Evers, Robert C.; and Dotrong, My, to United States of America, Air Force. Crosslinkable rigid-rod aromatic heterocyclic polymer. 5,066,769, Cl. 528-337.000.

Ewen, John A., to Fina Technology, Inc. Polymerization of olefins with an improved catalyst system using a new electron donor. 5,066,738, Cl. 526-124.000.

Excet Corporation: *See—*
Ingalls, Robert A., 5,066,205, Cl. 418-1.000.

Exxon Chemical Patents Inc.: *See—*
Audett, Jay D., 5,066,728, Cl. 525-314.000.
Dickakian, Ghazi B., 5,066,598, Cl. 436-2.000.
German, Paul M., Jr., 5,066,526, Cl. 428-35.200.
Randall, James C., Jr.; and Huff, Terrence, 5,066,723, Cl. 525-194.000.

Exxon Research and Engineering Company: *See—*
Agarwal, Pawan K.; and Pugel, Thomas, 5,066,694, Cl. 524-60.000.
Baird, William C., Jr.; and Swan, George A., 5,066,632, Cl. 502-223.000.
Peiffer, Dennis G., 5,066,753, Cl. 526-310.000.

EZ Drill, Inc.: *See—*
Hake, Leon M.; and Zerr, Ronald D., 5,065,984, Cl. 254-18.000.

Ezzell, Bobby R.: *See—*
Clement, Katherine S.; Babb, David A.; and Ezzell, Bobby R., 5,066,746, Cl. 526-242.000.

Fabiny, William J.: *See—*
Mosser, Mark F.; Eddinger, Kevin B.; and Fabiny, William J., 5,066,540, Cl. 428-336.000.

Fabre, Pierre: *See—*
Simonet, Benoit; Fabre, Pierre; Laluet, Jacques; and Egraz, Jean-Bernard, 5,066,710, Cl. 524-555.000.

Fagg, Barry S., to R. J. Reynolds Tobacco Company. Tobacco processing. 5,065,775, Cl. 131-297.000.

Fahy, John S.: *See—*
Bianco, James S.; Madsen, James T.; Ceppetelli, Michael; and Fahy, John S., 5,067,155, Cl. 380-25.000.

Failla, Stephen J.: *See—*
Deniega, Jose C.; and Failla, Stephen J., 5,066,288, Cl. 604-274.000.

Falk, Bernhard: *See—*
Ruff, Klaus; Falk, Bernhard; and Gratz, Werner, 5,066,472, Cl. 423-342.000.

Fallik, Joel. Expandable refrigerated enclosure for computer boards. 5,067,040, Cl. 361-384.000.

Fallows, W. Joseph, III: *See—*
Amr, Yehia M.; Fallows, W. Joseph, III; and Hogan, Mark R., 5,066,194, Cl. 415-223.000.

Falz, Ulrich: *See—*
Lunke, Manfred; Falz, Ulrich; and Walter, Jurgen, 5,066,263, Cl. 464-96.000.

Fanuc Ltd.: *See—*
Kishi, Hajimu; Mizuno, Tohru; and Kanda, Yuichi, 5,066,847, Cl. 219-124.340.
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,067,087, Cl. 364-474.240.
Yamazaki, Etsuo; and Iehisa, Nobuaki, 5,067,086, Cl. 364-474.080.

Fanuc Ltd: *See—*
Watanabe, Atsushi, 5,066,902, Cl. 318-568.160.

Farel, Richard A.; and Gawande, Mohan, to AT&T Bell Laboratories. Control of overload in communications networks. 5,067,074, Cl. 395-200.000.

Farfaglia, Leonard T., deceased (by Farfaglia, Mary M., legal representative); Campbell, Timothy J.; Gipson, Billy P.; Matambo, Thompson; and Thompson, Christoper M., to Whirlpool Corporation. Dual side discharge air housing for room air conditioner. 5,065,597, Cl. 62-262.000.

Farfaglia, Leonard T., deceased: *See—*
Harris, James E.; Farfaglia, Leonard T., deceased; and Wetherholt, Steven D., 5,065,596, Cl. 62-262.000.

Farfaglia, Mary M., legal representative: *See—*
Farfaglia, Leonard T., deceased; Campbell, Timothy J.; Gipson, Billy P.; Matambo, Thompson; and Thompson, Christoper M., 5,065,597, Cl. 62-262.000.
Harris, James E.; Farfaglia, Leonard T., deceased; and Wetherholt, Steven D., 5,065,596, Cl. 62-262.000.

Faria, Manuel S. Reusable liquid filter assembly. 5,066,391, Cl. 210-85.000.

Farman, Brian F., to Lucas Industries Public Limited Company. Digital control system. 5,067,080, Cl. 364-431.040.

Farner, Peter W.; and Cocks, Franklin H. Process for producing flat plate illumination devices. 5,066,257, Cl. 445-26.000.

Farnsworth, Elmer D. Automobile headlamp and rotatable sidelamp of integrated construction and switching circuit for operating same. 5,067,055, Cl. 362-66.000.

Farnsworth, Thomas L., to Invequest, Inc. Method of shredding carbon paper. 5,065,947, Cl. 241-30.000.

Farr, Glyn P. R., to Lucas Industries Public Limited Company. Hydraulic systems for vehicles. 5,066,077, Cl. 303-114.00R.

Farrell, Thomas J., to Cooper Industries, Inc. Weight set connecting mechanism for subsea tubular members. 5,066,048, Cl. 285-18.000.

Fattal, Jean A., to Raytheon Company. Method for detecting changes in spin rate of a missile in flight. 5,065,956, Cl. 244-3.200.

Faulkner, William G. Connectors for woven conveyor belts. 5,065,860, Cl. 198-848.000.

Favstritsky, Nicolai A.; and Nang, Jin-Liang, to Great Lakes Chemical Corporation. Flame retardant brominated styrene-based polymers. 5,066,752, Cl. 526-293.000.

Federighi, George J., Sr. Peeler for garlic or the like with centrifugal discharge. 5,065,672, Cl. 99-631.000.

Felder, Ernest; Musu, Carlo; Fumagalli, Luciano; and Uggeri, Fulvio, to Bracco Industria Chemica S.p.A. Preparation of 5-acylamino-2,4,6-triiodo- or tribromo-benzoic acid derivatives. 5,066,823, Cl. 560-13.000.

Felder, Stephen L.: *See—*
Chlebina, Larry E.; Majerus, Norbert; Rambacher, John S.; and Felder, Stephen L., 5,066,448, Cl. 264-334.000.

Feldhues, Michael; Kampf, Gunther; and Mecklenburg, Thomas, to Hoechst Aktiengesellschaft. Process for modifying electroconductive polymers using ion exchange. 5,066,731, Cl. 525-417.000.

Fell, Roger, to Scan Group Limited. Installations for measuring liquid depth. 5,065,624, Cl. 73-290.00V.

Felter, Richard E.; Markley, Dean A.; and Musser, Deborah L., to Armstrong World Industries, Inc. Static dissipative vinyl surface covering materials, methods for them, and composition for static dissipation. 5,066,422, Cl. 252-511.000.

Ferdows, Houshang, to Relco, Inc. Prefabricated bus housing. 5,066,067, Cl. 296-197.000.

Ferguson, Jo A. Prophylactic/contraceptive device. 5,065,771, Cl. 128-835.000.

Ferincz, John. Wax-casting components. 5,066,213, Cl. 425-175.000.

Ferrante, Ronald A., to McDonnell Douglas Corporation. Binary alignment corrector. 5,066,100, Cl. 359-569.000.

Ferretti, August; and Gier, Thurman E., to Du Pont de Nemours, E. I., and Company. Hydrothermal process for growing optical-quality single crystals. 5,066,356, Cl. 156-623.00R.

Ferretti, Joseph J.; and Malke, Horst, to University of Okla., Board of Regents of the. Streptokinase-coding recombinant vectors. 5,066,589, Cl. 435-172.300.

Ferris Mfg. Co.: *See—*
Sessions, Robert W.; and Carr, Roy D., 5,065,752, Cl. 128-156.000.

Fersht, Samuel N.: *See—*
Stewart, Robert E.; and Fersht, Samuel N., 5,065,627, Cl. 73-505.000.

Fiedler, Edgar F. Dispenser head for flowable materials. 5,065,910, Cl. 222-504.000.

Fields, Raymond L.: *See—*
Robey, Frank A.; Fields, Raymond L.; and Lindner, Wolfgang, 5,066,716, Cl. 525-54.100.

Fildan Accessories Corp.: *See—*
Fildan, Gerhard, 5,065,916, Cl. 223-91.000.

Fildan, Gerhard, to Fildan Accessories Corp. Garment hanger with molded integral clips. 5,065,916, Cl. 223-91.000.

Filthuth, Heinz. Device for detecting ionizing radiation. 5,066,862, Cl. 250-393.000.

Fina Technology, Inc.: *See—*
Ewen, John A., 5,066,738, Cl. 526-124.000.

Finch, Harry: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.

Fine, David A.: *See*—
DeVoe, Irving W.; D'Sylva, Olwyn A.; and Fine, David A., 5,066,371, Cl. 204-149.000.

Finley, Arthur C. Movable support for window washers and the like. 5,065,838, Cl. 182-38.000.

Fiori, Achille: *See*—
Moro, Luigi; Fiori, Achille; and Natali, Alberto, 5,066,495, Cl. 424-451.000.

Firnhaber, Bernhard: *See*—
Wetzel, Rolf; and Firnhaber, Bernhard, 5,066,476, Cl. 423-648.100.

Pirooz, Kamran, to Hewlett-Packard Company. Apparatus for testing an electronic circuit having an arbitrary output waveform. 5,066,909, Cl. 324-158.00R.

Firth, David G., to Model & Instrument Development Corporation. Prosthetic foot having a low profile cantilever spring keel. 5,066,305, Cl. 623-55.000.

Fischer, Anton: *See*—
Gabathuler, Jean-Pierre; Eckert, Karl-Ludwig; Kaser, Peter; Maurer, Albert; and Fischer, Anton, 5,066,432, Cl. 264-28.000.

Fischer, Berthold: *See*—
Berges, Hanns-Peter; Fischer, Berthold; Mueller, Peter; and Vorberg, Dieter, 5,066,202, Cl. 417-228.000.

Fischer, Florian; and Ritzer, Christian, to Messerschmitt-Bolkow-Blohm GmbH. Transmission having an eccentric and a cycloid gearing. 5,066,267, Cl. 475-168.000.

Fischer, Frederick H.; Lee, Kuo-hua; Nagy, William J.; and Selamoglu, Nur, to AT&T Bell Laboratories. Severable conductive path in an integrated-circuit device. 5,066,998, Cl. 357-51.000.

Fisher, Robert S.: *See*—
Eaton, Harry A. C.; and Fisher, Robert S., 5,066,272, Cl. 600-9.000.

Fite, Elaine H.; Fossum, Tryggve; Grundmann, William R.; McKeen, Francis X.; and Salett, Ronald M., to Digital Equipment Corporation. Control of multiple functional units with parallel operation in a microcoded execution unit. 5,067,069, Cl. 395-375.000.

Flakus, Werner, to Huels Aktiengesellschaft. Process for the preparation of aqueous, radiation-curable urethaneacrylate dispersions. 5,066,713, Cl. 524-591.000.

Flanhardt, Michael; Roth, Andreas; and Nienhaus, Clemens, to Jean Walterscheid GmbH. Double bevel gear angular drive. 5,065,639, Cl. 74-417.000.

Flisram, Dennis G., to Oscar Mayer Foods Corporation. Food slicing with multiple cutting surface blade. 5,065,656, Cl. 83-356.003.

Flora, David D.: *See*—
Legler, John G.; Bartlett, Robert L.; and Flora, David D., 5,065,652, Cl. 83-168.000.

Flynn, Daniel L.: *See*—
Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 5,066,668, Cl. 514-384.000.

FMC Corporation: *See*—
Lochmann, Bernhard, 5,065,787, Cl. 137-315.000.

Fodor, Lawrence M.; and Willcox, Kenneth W., to Phillips Petroleum Company. Deodorizing odorous polyolefins with low concentrations of inorganic oxidizing agents. 5,066,686, Cl. 523-102.000.

Fohl, Artur, to TRW Repa GmbH. Belt lock for a safety belt system provided with a tightening means. 5,066,042, Cl. 280-806.000.

Fong, Craig S.: *See*—
Adams, William J.; Jex Courter, Barbara G.; Fong, Craig S.; Murray, Robert C.; and Marshall, Paul A., 5,065,962, Cl. 244-234.000.

Fong, Ding-Huei R.; and Carlstedt, Richard A., to Miner Enterprises, Inc. Preshortening insert for a draft gear. 5,065,874, Cl. 213-31.000.

Forbes Jones, Robin M.; Panzera, Carl; and DeLuca, Robert D., to Johnson & Johnson Consumer Products, Inc. Crystalline alumina orthodontic bracket. 5,066,225, Cl. 433-8.000.

Ford, David F.: *See*—
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.

Ford, James: *See*—
Heppenstall, Neil G.; Betts, Colin; and Ford, James, 5,066,453, Cl. 376-352.000.

Ford Motor Company: *See*—
Amner, John A., 5,065,920, Cl. 224-275.000.
Johnson, Jonathon S., 5,065,647, Cl. 76-108.600.
Klassen, David J.; and Anderson, Edward G., 5,066,919, Cl. 324-538.000.
Ma, Thomas T., 5,066,023, Cl. 277-2.000.
Schmidt, Norman G., 5,066,940, Cl. 340-453.000.
Stapel, William C., 5,067,057, Cl. 362-83.200.

Forrest, William J.; and Taylor, Lewis C. Retractor support assembly. 5,065,739, Cl. 128-20.000.

Forsyth, Richard C. E., to Mabey & Johnson Limited. Prefabricated lattice panels for a bridge. 5,065,467, Cl. 14-13.000.

Fort, Jeffrey W.: *See*—
Smith, Jay, III; and Fort, Jeffrey W., 5,067,079, Cl. 364-410.000.

Foss, Kristin K.: *See*—
Soderberg, Paulmer M.; Foss, Kristin K.; Giles, Thomas E.; and Narciso, Ralph A., 5,066,139, Cl. 371-20.100.

Fossum, Tryggve: *See*—
Fite, Elaine H.; Fossum, Tryggve; Grundmann, William R.; McKeen, Francis X.; and Salett, Ronald M., 5,067,069, Cl. 395-375.000.

Foster, Lewis R. Sail batten compression adjustment fitting. 5,065,686, Cl. 114-103.000.

Foxboro Company, The: *See*—
Angelosanto, John P.; and Sgourakes, George E., 5,065,611, Cl. 73-4.00R.

Foxgrover, Brian A.: *See*—
Perko, Jack E.; Wirth, Gary J.; and Foxgrover, Brian A., 5,066,349, Cl. 156-166.000.

Francotte, Eric; and Baisch, Gabriele, to Ciba-Geigy Corporation. Finely particulate cellulose esters of aromatic or aromatic-aliphatic carboxylic acids, process for their preparation, and the use thereof. 5,066,793, Cl. 536-50.000.

Frank, Steven J.: *See*—
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.

Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, to Bendix Atlantic Inflator Company. Driver side hybrid inflator and air bag module. 5,066,038, Cl. 200-737.000.

Frantz, Earl L.: *See*—
Harner, Leslie L.; and Frantz, Earl L., 5,066,886, Cl. 313-404.000.

Frantz, Keith R. Circuit for producing four indications on a bicolor light emitting diode having two leads. 5,066,929, Cl. 331-57.000.

Franz, Gerhard: *See*—
Pitzer, Ulrike; Franz, Gerhard; and Laubach, Benno, 5,066,473, Cl. 423-344.000.

Fraser, George M., to Cleaning Technology Limited. Abrasive cleaning or cutting. 5,065,551, Cl. 51-410.000.

Fraser, Howard H., Jr.: *See*—
Etemad, Shahrokh; and Fraser, Howard H., Jr., 5,065,550, Cl. 51-317.000.

Fraunhofer Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Benecke, Wolfgang, 5,065,628, Cl. 73-517.00R.

Fred Arbogast Company, Inc.: *See*—
Coody, Archibald S., 5,065,541, Cl. 43-42.290.

Frederickson, James D.: *See*—
Grubbs, Robert E.; Haberkern, Richard G.; Edwards, Michael E.; and Frederickson, James D., 5,065,774, Cl. 131-291.000.

Fredette, Maurice C. J.: *See*—
Zell, Michael S.; and Fredette, Maurice C. J., 5,066,477, Cl. 423-479.000.

Freiberg, Alan L.; Lefler, Harold V., III; and Liles, Donald T., to Dow Corning Corporation. Method of protecting porous masonry. 5,066,520, Cl. 427-379.000.

Freitag, Dieter: *See*—
Russeler, Wolfgang; Idel, Karsten-Josef; Dorf, Ernst-Ulrich; Alewelt, Wolfgang; and Freitag, Dieter, 5,066,776, Cl. 528-388.000.

Freitag, Ronald G., to Westinghouse Electric Corp. Multi push-pull MMIC power amplifier. 5,066,925, Cl. 330-269.000.

Frey, Paul T.: *See*—
Jones, Lawrence D.; Frey, Paul T.; Gleason, David D.; Chee, Paula P.; and Slightom, Jerry L., 5,066,587, Cl. 435-172.100.

Frick, Stephen D.: *See*—
Roach, Ernest F.; Frick, Stephen D.; and Sample, Randell F., 5,065,796, Cl. 139-300.000.

Fried, Herbert E.; and Johnson, Thomas H., to Shell Oil Company. Preparation of carboxylic acid esters. 5,066,829, Cl. 560-217.000.

Friedhoff, Lawrence T.: *See*—
Ogletree, Martin L.; Schumacher, William A.; Grover, Gary J.; and Friedhoff, Lawrence T., 5,066,480, Cl. 424-10.000.

Friedrich, Maria S.: *See*—
Suresh, Dev D.; DiCosimo, Robert; Loiseau, Richard; Friedrich, Maria S.; and Szabo, Hsiao-Chiung, 5,066,809, Cl. 546-250.000.

Friedrich Wilh. Schwing GmbH: *See*—
Coja, Joachim; von Eckardstein, Karl-Ernst; and Simnovec, Andrej, 5,066,203, Cl. 417-318.000.

Frigger, Heinz; and Blum, Klaus-Dieter, to Alfred Teves GmbH. Brake system for automotive vehicles. 5,066,073, Cl. 303-92.000.

Frito-Lay, Inc.: *See*—
Center, John L.; Mills, William C., Jr.; and Plaskett, John R., 5,066,269, Cl. 493-183.000.

Fritzsche, Peter: *See*—
Soltermann, Roland; Fritzsche, Peter; and Muller, Kurt, 5,065,637, Cl. 74-99.00R.

Frollini, Dominick, Jr.: *See*—
Levy, Alan B.; Sifniades, Stylianos; Kent, Lloyd C.; and Frollini, Dominick, Jr., 5,066,373, Cl. 204-153.210.

Frye, Ruth E. Solid, pliable organic compound for hot/cold thermal reservoir. 5,066,411, Cl. 252-70.000.

Fuji Electric Co., Ltd.: *See*—
—Shimizu, Hideo; and Takahashi, Yasuhiro, 5,067,117, Cl. 369-116.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kobayashi, Toshio, 5,066,268, Cl. 475-249.000.
Takagaki, Katsumi, 5,065,841, Cl. 184-6.180.

Fuji Kiko Company, Limited: *See*—
Yamamoto, Yoshimi; and Kino, Keisuke, 5,065,641, Cl. 74-473.0SW.

Fuji Photo Film Co., Ltd.: *See*—
Adachi, Yuuma, 5,067,163, Cl. 382-6.000.
Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, 5,066,563, Cl. 430-213.000.
Hatori, Masami, 5,066,126, Cl. 356-328.000.
Ichijima, Seiji; Saito, Naoki; Mihayashi, Keiji; Ishii, Yoshio; and Ogawa, Akira, 5,066,576, Cl. 430-558.000.
Kawasaki, Kazuya; Tanaka, Mitsutoshi; Amano, Yoshikazu; and Katsuyama, Harumi, 5,066,462, Cl. 422-56.000.
Matushita, Tetunori; Yagihara, Morio; and Sakanoue, Kei, 5,066,573, Cl. 430-542.000.
Nakamura, Hiroshi, 5,066,562, Cl. 430-203.000.
Nakamura, Koki; Ito, Takayuki; Tsukase, Massaki; and Taguchi, Toshiki, 5,066,577, Cl. 430-562.000.
Nakamura, Takashi; and Kurokawa, Toshio, 5,066,570, Cl. 430-421.000.
Sato, Tadahisa; Takahashi, Osamu; Naruse, Hideaki; and Mizukawa, Yuki, 5,066,575, Cl. 430-558.000.
Takahashi, Yohnosuke, 5,067,029, Cl. 358-909.000.
Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,066,571, Cl. 430-489.000.

Fuji Xerox Co., Ltd.: *See*—
Kanagawa, Takashi; Shiino, Yutaka; and Furuyama, Tetsuya, 5,066,976, Cl. 355-200.000.

Fujii, Akiyoshi: *See*—
Deguchi, Katsuyasu; Mizoguchi, Takatoshi; Taminaga, Takayuki; and Fujii, Akiyoshi, 5,066,960, Cl. 346-76.0PH.

Fujii, Hiroshi, to Sony Corporation. Tape cassette having outer and inner lids locked by the inner lid. 5,065,955, Cl. 242-198.000.

Fujii, Natsuji: *See*—
Kaneda, Ichiro; Yamamoto, Seiji; and Fujii, Natsuji, 5,066,075, Cl. 303-113.00R.

Fujii, Syuso: *See*—
Sakurai, Kiyofumi; Fujii, Syuso; and Shimizu, Mitsuru, 5,066,997, Cl. 357-45.000.

Fujii, Toshifumi: *See*—
Yamasaki, Tatsuo; and Fujii, Toshifumi, 5,067,031, Cl. 360-22.000.

Fujii, Yozo: *See*—
Yoshino, Kunihisa; Motohashi, Mitsuo; and Fujii, Yozo, 5,065,693, Cl. 118-657.000.

Fujiki, Hironao: *See*—
Inoue, Yoshio; Yoshino, Masachika; and Fujiki, Hironao, 5,066,714, Cl. 524-731.000.

Fujiki, Yoshinori: *See*—
Komatsu, Yu; Fujiki, Yoshinori; and Sasaki, Takayoshi, 5,066,404, Cl. 210-670.000.

Fujikura Ltd.: *See*—
Yamauchi, Ryozo; Kawakami, Noboru; and Suzuki, Fumio, 5,066,087, Cl. 385-43.000.

Fujimaki, Tatsuo: *See*—
Hamada, Tatsuro; Fukuoka, Hiromi; Komatsu, Hideki; and Fujimaki, Tatsuo, 5,066,721, Cl. 525-102.000.

Fujimoto, Sachito; and Koike, Yuzuru, to Honda Giken Kogyo Kabushiki Kaisha. System for preventing overheat of engine for vehicle. 5,065,705, Cl. 123-41.150.

Fujimoto, Shinji; and Yamaguchi, Mitsugu, to Kabushiki Kaisha Daikin Seisakusho. Lockup clutch of torque converter. 5,065,853, Cl. 192-3.290.

Fujimoto, Yoshitomi: *See*—
Kanazawa, Hirotaka; Fujimoto, Yoshitomi; and Suzuki, Michio, 5,065,576, Cl. 60-295.000.

Fujimura, Masaaki: *See*—
Fukuzawa, Shigeo; Kaneko, Takahide; and Fujimura, Masaaki, 5,066,217, Cl. 425-589.000.

Fujimura, Yuji: *See*—
Hirabayashi, Kazuo; Oono, Tetsuya; Akiyama, Eitetsu; Ishii, Yukihisa; Sekiya, Shigenobu; and Fujimura, Yuji, 5,065,834, Cl. 180-197.000.

Fujinaga, Masato: *See*—
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,067,101, Cl. 364-578.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Shiokawa, Youichi; Okumura, Kazuo; Take, Kazuhiko; and Tsubaki, Kazunori, 5,066,680, Cl. 514-622.000.

Fujita, Toshio: *See*—
Bhandari, Pradeep; and Fujita, Toshio, 5,066,337, Cl. 136-202.000.

Fujita, Tsutomu: *See*—
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Fujita, Tsutomu, 5,066,602, Cl. 437-31.000.

Fujito, Kazumi: *See*—
Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, 5,066,344, Cl. 156-138.000.

Fujitsu Limited: *See*—
Chida, Jun, 5,067,066, Cl. 363-16.000.
Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; Arai, Yasunari; and Ihara, Takeshi, 5,066,877, Cl. 307-603.000.
Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, 5,067,123, Cl. 370-58.100.
Kaneta, Hiroshi; and Muraishi, Shuichi, 5,066,599, Cl. 437-7.000.
Kotachi, Akiko; Takechi, Satoshi; and Nakamura, Yuko, 5,066,751, Cl. 526-279.000.
Miura, Takao; and Imaoka, Kazunori, 5,066,993, Cl. 357-23.700.
Ohba, Takayuki; Miyagaki, Shinji; Hara, Tatsushi; Morishita, Kenji; Suzuki, Seiichi; and Ri, Seigen, 5,066,612, Cl. 437-192.000.
Tonomoto, Yoshihiro, 5,066,983, Cl. 355-297.000.
Wakimoto, Yasuhiro; and Suzuki, Tetsuo, 5,067,077, Cl. 395-400.000.
Watarai, Shinichi; Yasuda, Megumi; Houki, Yoji; and Nishio, Yukio, 5,066,978, Cl. 355-206.000.

Fujiwara, Katsuki: *See*—
Omure, Yukio; Fujiwara, Katsuki; Tsuchiya, Tatsumi; Hishida, Satoshi; Noguchi, Masahiro; and Yamamoto, Ikuo, 5,066,410, Cl. 252-68.000.

Fujiwara, Yasuhiko: *See*—
Doi, Kazuhiro; Fujiwara, Yasuhiko; Abe, Toshiro; and Matsui, Shinichi, 5,065,869, Cl. 207-140.100.

Fukami, Seiji: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.

Fukao, Kaname; Hamanaka, Toshiyuki; Harada, Takashi; and Kondo, Noboru, to NGK Insulators, Ltd. Ceramic materials for use in insert-casting and processes for producing the same. 5,066,626, Cl. 501-128.000.

Fukuchi, Tadakazu: *See*—
Minami, Toshiaki; Fukuchi, Tadakazu; Ohashi, Reiji; and Kaneko, Toshio, 5,066,634, Cl. 503-209.000.

Fukuda, Kiyohito: *See*—
Kato, Tetsuo; Fukuda, Kiyohito; Watanabe, Hiroshi; Terada, Katsuaki; and Taguchi, Naoto, 5,066,252, Cl. 439-752.000.

Fukuda, Shinri; and Ishii, Eiichi, to NEC Corporation. Circuit for converting ECL level signals to MOS level signals. 5,066,876, Cl. 307-475.000.

Fukuda, Tsuguhiro; Nakagomi, Hiroshi; and Karita, Seiichirou, to Canon Kabushiki Kaisha. Recording head having cooling mechanism therefor. 5,066,964, Cl. 346-140.00R.

Fukui, Toshimasa: *See*—
Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, 5,067,123, Cl. 370-58.100.

Fukunaga, Takahiro: *See*—
Nakanishi, Yasushi; and Fukunaga, Takahiro, 5,066,975, Cl. 355-200.000.

Fukuoka, Hiromi: *See*—
Hamada, Tatsuro; Fukuoka, Hiromi; Komatsu, Hideki; and Fujimaki, Tatsuo, 5,066,721, Cl. 525-102.000.

Fukuzawa, Shigeo; Kaneko, Takahide; and Fujimura, Masaaki, to Ube Industries, Ltd. Clamping apparatus for an injection molding machine. 5,066,217, Cl. 425-589.000.

Fumagalli, Luciano: *See*—
Felder, Ernest; Musu, Carlo; Fumagalli, Luciano; and Uggeri, Fulvio, 5,066,823, Cl. 560-13.000.

Fumanti, Robert R. V.: *See*—
Kolstad, Lawrence E.; and Fumanti, Robert R. V., 5,066,033, Cl. 280-414.100.

Funston, David L., to Eastman Kodak Company. Dual sensor film scanner having coupled optics and a video viewfinder. 5,067,020, Cl. 358-214.000.

Fuqua Industries, Inc.: *See*—
McDonner, Orville R., 5,066,146, Cl. 384-473.000.

Furlow, George R. Petrochemical recovery machine. 5,066,407, Cl. 210-744.000.

Furtak, Hans; Naber, Wilfrid; and Lejeune, Raymond, to Isover Saint-Gobain. Process and device for the reception of mineral fibers. 5,065,478, Cl. 19-296.000.

Furudate, Misturu: *See*—
Oyama, Minoru; and Furudate, Misturu, 5,067,050, Cl. 362-30.000.

Furuhashi, Hiroyuki: *See*—
Doi, Yoshiharu; Ueki, Satoshi; and Furuhashi, Hiroyuki, 5,066,754, Cl. 526-336.000.

Furukawa, Masamichi: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.

Furumoto, Horace, to Candela Laser Corporation. Light amplifier and method of photothemolysis. 5,066,293, Cl. 606-9.000.

Furuta, Katsumi; and Yamaguchi, Takashi, to Nissan Motor Co., Ltd. Bumper structure. 5,066,057, Cl. 293-121.000.

Furuya, Takeo: *See*—
Sekine, Shuji; Furuya, Takeo; and Sato, Katsuhiro, 5,066,878, Cl. 310-68.00C.

Furuyama, Tetsuya: *See*—
Kanagawa, Takashi; Shiino, Yutaka; and Furuyama, Tetsuya, 5,066,976, Cl. 355-200.000.

Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Morimoto, Kiyoshi; Itoh, Shigeo; Tonegawa, Takeshi; and Niiyama, Takahiro, 5,066,885, Cl. 313-340.000.

Futakawa, Tetsuo: *See*—
Anzawa, Norio; Adachi, Koji; Futakawa, Tetsuo; Sato, Hironari; and Narita, Akira, 5,066,219, Cl. 431-10.000.

Futamata, Yukio: *See*—
Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, 5,066,982, Cl. 355-269.000.

G. D. Searle & Co.: *See*—
Mueller, Richard A.; and Partis, Richard A., 5,066,679, Cl. 514-618.000.

Gabathuler, Jean-Pierre; Eckert, Karl-Ludwig; Kaser, Peter; Maurer, Albert; and Fischer, Anton, to Alusuisse-Lonza Services Ltd. Process for manufacturing a ceramic foam body. 5,066,432, Cl. 264-28.000.

Gaesser, George: *See*—
Shibata, Tomoo; Semler, John; and Gaesser, George, 5,066,633, Cl. 503-209.000.

GAF Chemicals Corporation: *See*—
Chaudhuri, Ratan K.; Haldar, Rama K.; and Gangadharan, Balgopal, 5,066,709, Cl. 524-516.000.

Gaffan, Charles; and Schwarzpech, Bruno K., to GTE Valenite Corporation. Aluminum piston wrist pin boring tool. 5,066,173, Cl. 408-59.000.

Gahan, Richard J.: *See*—
Lynam, Niall R.; and Gahan, Richard J., 5,066,112, Cl. 359-267.000.

Gailus, Paul H.; Yester, Francis R.; and Turney, William J., to Motorola, Inc. Linear transmitter training method and apparatus. 5,066,923, Cl. 330-107.000.

Gaiser, William R.: *See*—
Bartley, Harold D.; and Gaiser, William R., 5,066,081, Cl. 215-1.00C.

Gaisser, Hermann, to Hermann Wangner GmbH & Co. Woven multilayer papermaking fabric having increased stability and permeability and method. 5,066,532, Cl. 428-137.000.

Galanek, Mitchell S.: *See*—
Stinson, Margaret C.; and Galanek, Mitchell S., 5,066,597, Cl. 435-311.000.

Galdon, Francisco: *See*—
Quantin, Daniele; and Galdon, Francisco, 5,066,548, Cl. 428-629.000.

Gall, Arthur; and Kupfer, Adelbert, to Siemens Aktiengesellschaft. X-ray diagnostics installation with a gating unit for the dominant image region. 5,067,142, Cl. 378-99.000.

Gallagher, Thomas A., to Van Dorn Company. Improved ringless paint container with step down lid. 5,065,888, Cl. 220-355.000.

Gallup, David F.: *See*—
Gunning, Kevin J.; and Gallup, David F., 5,066,836, Cl. 200-61.45R.
Gunning, Kevin J.; Gallup, David F.; and Bell, Lon E., 5,066,837, Cl. 200-61.45R.

Gangadharan, Balgopal: *See*—
Chaudhuri, Ratan K.; Haldar, Rama K.; and Gangadharan, Balgopal, 5,066,709, Cl. 524-516.000.

Gannon, Richard: *See*—
Agarwal, Jagdish A.; Gannon, Richard; Goldfarb, Victor; Stickler, David; and Woodroffe, Jaime, 5,066,326, Cl. 75-581.000.

Ganse, Shigeru, to Sony Corporation. Apparatus for recording and/or reproducing a component video signal having a luminance signal of a wide frequency band and a chroma signal in a band below the high end of the luminance signal band and within the latter. 5,067,009, Cl. 358-12.000.

Garcia, Graham A.: *See*—
Reedy, Ronald E.; Garcia, Graham A.; and Lagnado, Isaac, 5,066,613, Cl. 437-200.000.

Gardiner, Robert W.: *See*—
Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.

Garelick, Paul: *See*—
Merianos, John J.; Login, Robert B.; and Garelick, Paul, 5,066,488, Cl. 424-80.000.

Garland, Patricia A. Dispenser for bandages. 5,065,894, Cl. 221-25.000.

Garnweidner, Peter, to Austria Metall Aktiengesellschaft. Door assembly for a passenger vehicle. 5,066,064, Cl. 296-146.000.

Garrison, Sidney C.: *See*—
Peterson, William M.; Anderson, Howard C.; Leivian, Robert; and Garrison, Sidney C., 5,067,095, Cl. 395-24.000.

Gas Research Institute: *See*—
Agarwal, Jagdish A.; Gannon, Richard; Goldfarb, Victor; Stickler, David; and Woodroffe, Jaime, 5,066,326, Cl. 75-581.000.
Monahan, Russell, 5,065,579, Cl. 60-524.000.

Gates, David E. Trimmer attachment for mowing decks. 5,065,566, Cl. 56-12.700.

Gaube, Guy. Height adjustable plant hanging device. 5,065,971, Cl. 248-330.100.

Gaudreau, Pierrette: *See*—
Cohen, Eric A.; Gaudreau, Pierrette; Michaud, Jacques; Brazeau, Paul; and Langelier, Yves, 5,066,783, Cl. 530-328.000.

Gaver, Joseph C., Jr.; and Jorgenson, James C., to LRC Electronics, Inc. Manually installable coaxial cable connector. 5,066,248, Cl. 439-578.000.

Gavin, Norman W.; and Jaecklin, Felix P. Retaining wall system. 5,066,169, Cl. 405-284.000.

Gawande, Mohan: *See*—
Farel, Richard A.; and Gawande, Mohan, 5,067,074, Cl. 395-200.000.

Gay, Michel: *See*—
Salavin, Serge; Deschamps, Jacques; Gay, Michel; and Specty, Michel, 5,066,890, Cl. 313-585.000.

GEC Alsthom SA: *See*—
Maineult, Jean; and Pluveau, Raymond, 5,066,839, Cl. 200-144.00R.

Geer, Charles P.: *See*—
Borkenhagen, John M.; Schmierer, Quentin; and Geer, Charles P., 5,067,105, Cl. 395-400.000.

Gehly, Joel C.; Zolner, David; and Szumigala, James M., to American Sterilizer Company. Pattern change mechanism. 5,067,064, Cl. 362-277.000.

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Greco, Michael N.; and Janssen, Marcel A. C., to Janssen Pharmaceutica N.V. Pharmacologically active (6,7-dihydro-5H-pyrrolo[1,2-c]imidazol-5-yl)- and (5,6,7,8-tetrahydroimidazo[1,5-a]pyridin-5-yl) substituted 1H-benzotriazole derivatives. 5,066,656, Cl. 514-269.000.
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Gupta, Vijai P., to ARCO Chemical Technology, Inc. Manufacture of C2-C8 olefin/maleic anhydride copolymers. 5,066,742, Cl. 526-216.000.

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Hagelin, Jack S.: *See*—
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Eslinger, David M., 5,065,789, Cl. 137-513.500.

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Myska, Glen A., 5,065,619, Cl. 73-152.000.
Rau, Rama N., 5,066,916, Cl. 324-338.000.

Halliday, David K.: *See*—
Akam, Nigel J.; Cameron, Donald M.; Halliday, David K.; and Paterson, Raymond, 5,065,858, Cl. 198-493.000.

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Lehtola, Raimo, 5,065,857, Cl. 198-457.000.

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Kuratate, Tomoaki; Koden, Mitsuhiro; and Hamada, Hiroshi, 5,066,109, Cl. 359-54.000.

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Hamanaka, Toshiyuki: *See*—
Fukao, Kaname; Hamanaka, Toshiyuki; Harada, Takashi; and Kondo, Noboru, 5,066,626, Cl. 501-128.000.

Hamann, J. Eric, to Eastman Kodak Company. Prespot detection method and apparatus in an analyzer. 5,067,092, Cl. 364-496.000.

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Hamed, Parviz: *See*—
O'Rell, Dennis; Hamed, Parviz; and DiPerna, Thomas C., 5,066,537, Cl. 428-246.000.

Hammer Corporation: *See*—
Jones, Gary A., 5,066,003, Cl. 272-134.000.
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Hammer, Hans. Parking system and method of automatically parking motor vehicles. 5,066,187, Cl. 414-237.000.

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Hanak, Pavel; Motte, Philippe; and Gosset, Patrice, to ARCO Chemical Technology, Inc. Fibre-reinforced rigid polyurethane foam and polyol component therefor. 5,066,685, Cl. 521-163.000.

Hancock, Jimmy W.; Kelly, Michael J.; Latham, Wayne M.; and Stinnett, Carlton E., to Babcock & Wilcox Company, The. Ultrasonic profilometry system for control rod wear. 5,066,452, Cl. 376-252.000.

Handley, Graham R.: *See*—
Davey, Rodney J.; Handley, Graham R.; and Ward-Smith, Alfred J., 5,065,928, Cl. 226-7.000.

Hanisch, Ferdinand; and Schleese, Eckard, to Kabelmetal Electro GmbH. Ascertaining high energy radiation. 5,066,863, Cl. 250-474.100.

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Krause, Norbert; Hanke, Wilhelm; and Ruhl, Juergen, 5,065,760, Cl. 128-653.500.

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Destryker, Elise; and Hannecart, Etienne, 5,066,706, Cl. 524-459.000.

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Hansen, Guenter; Lamm, Gunther; and Loeffler, Hermann, to BASF Aktiengesellschaft. Pyridoneazo dyes with an M-aminobenzoic ester as the diazo component. 5,066,791, Cl. 534-772.000.

Hansen, Robert G., to R. G. Hansen & Associates. Apparatus for removing ground contaminants. 5,066,166, Cl. 405-128.000.

Hanson, Andrew D., to Industrial Materials Technology, Inc. Isostatic processing with shrouded melt-away mandrel. 5,066,454, Cl. 419-42.000.

Hanson, Douglas W.; Wang, Shein S.; and Harlan, William S., to Conoco Inc. Efficient generation of traveltime tables for two dimensional and three dimensional prestack depth migration. 5,067,113, Cl. 367-50.000.

Hanson, Richard A. Pendulous assembly for use in an accelerometer. 5,065,626, Cl. 73-497.000.

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Hara, Hiroyuki; Sugimoto, Yasuhiro; and Nagamatsu, Tetsu, to Kabushiki Kaisha Toshiba. Channelless gate array with a shared bipolar transistor. 5,066,996, Cl. 357-43.000.

Hara, Hisao: *See*—
Kubo, Yutaka; and Hara, Hisao, 5,066,423, Cl. 252-516.000.

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Nakano, Hirofumi; Hara, Mitsunobu; Mokudai, Tsuyoshi; Kawamoto, Isao; Yoshida, Mayumi; and Kobayashi, Eiji, 5,066,817, Cl. 549-384.000.

Hara, Tatsushi: *See*—
Ohba, Takayuki; Miyagaki, Shinji; Hara, Tatsushi; Morishita, Kenji; Suzuki, Seiichi; and Ri, Seigen, 5,066,612, Cl. 437-192.000.

Hara, Toshio: *See*—
Kobayashi, Kazuhiro; Kouguthi, Hifumi; and Hara, Toshio, 5,065,674, Cl. 101-44.000.

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Fukao, Kaname; Hamanaka, Toshiyuki; Harada, Takashi; and Kondo, Noboru, 5,066,626, Cl. 501-128.000.

Haraeus Holding GmbH: *See*—
Perzl, Peter R.; Ruberg, Wolfgang; and Puell, Heinz B., 5,067,135, Cl. 372-83.000.

Hardin, Philip J. Axially reversing roller for printing presses and sheet coating machines. 5,065,676, Cl. 101-349.000.

Haring, Helmut: *See*—
Lorenz, Hans; Gross, Ing. H.; Schuchmann, Roland; and Haring, Helmut, 5,066,435, Cl. 264-40.500.

Harkrader, Ronald J.; Jones, Richard R.; and Peterson, Kenneth S., to Vipont Pharmaceutical, Inc. Oral rinse compositions. 5,066,483, Cl. 424-54.000.

Harlan, William S.: *See*—
Hanson, Douglas W.; Wang, Shein S.; and Harlan, William S., 5,067,113, Cl. 367-50.000.

Harmon, John L.: *See*—
Larson, Richard I.; Ringle, Richard P.; and Harmon, John L., 5,066,429, Cl. 264-0.500.

Harner, Leslie L.; and Frantz, Earl L., to Carpenter Technology Corporation. Thermally responsive article, method of making same, and a device incorporataing said article. 5,066,886, Cl. 313-404.000.

Harold Watson Limited: *See*—
Wall, Alan; Grayson, Peter; and Egerton, Michael, 5,066,162, Cl. 403-361.000.

Harper, George S., to North American Philips Corporation. Circuit breaker. 5,066,935, Cl. 335-172.000.

Harrelson, Hugh G.: *See*—
Yeh, Ling; Harrelson, Hugh G.; and Coons, Andrew M., III, 5,066,308, Cl. 8-403.000.

Harrington, Richard H. Swim goggle sealant. 5,066,022, Cl. 277-1.000.

Harris, Charles C. Container holding system. 5,065,922, Cl. 224-42.320.

Harris Corporation: *See*—
Young, William R.; and Rivoli, Anthony L., 5,066,995, Cl. 357-42.000.

Harris, James E.; Farfaglia, Leonard T., deceased (by Farfaglia, Mary M., legal representative); and Wetherholt, Steven D., to Whirlpool Corporation. Dual louvered side air discharge openings for room air conditioner. 5,065,596, Cl. 62-262.000.

Harris, Joseph W.: *See*—
Ballentine, Richard E.; and Harris, Joseph W., 5,066,456, Cl. 420-472.000.

Harrison, Mark R. Aquarium aeration and recycling apparatus. 5,066,394, Cl. 210-169.000.

Harrold, William J.; Sansone, Joseph A.; Bonfiglio, Joseph W.; and Kim, Seung K., to Raytheon Company. Magnetic field cancellation circuit. 5,066,891, Cl. 315-8.000.

Harry, John O.; Verhagen, George; and Small, Rudy E., to Corrosion Technology, Inc. Container for corrosive material. 5,066,379, Cl. 204-279.000.

Hart, George M.; and Hayford, Mark E., to Wacker Silicones Corporation. Transparent coating for rubber articles. 5,066,703, Cl. 524-437.000.

Hartke, Dennis V. Portable holder to support a recapped container of effervescent liquid in an inverted position to retain the liquid's freshness. 5,065,966, Cl. 248-146.000.

Hartman, Thomas G.; Manura, John J.; Overton, Santford V.; Baker, Christopher W.; and Manos, John N., to Rutgers University. Short path thermal desorption apparatus for use in gas chromatography techniques. 5,065,614, Cl. 73-23.350.

Hasebe, Noboru; and Ito, Shoji, to Misawa Homes Institute of Research & Development. Fingertip pulse wave sensor. 5,065,749, Cl. 128-664.000.

Hasegawa, Hideo: *See*—
Tajima, Ikuo; and Hasegawa, Hideo, 5,065,682, Cl. 112-103.000.

Hasegawa, Kenji: *See*—
Kimura, Isao; and Hasegawa, Kenji, 5,066,963, Cl. 346-140.00R.

Haselier, Franciscus J. J., to Stamicarbon B.V. Polyethylene composition, objects made therefrom and process for the manufacture of foamed objects. 5,066,725, Cl. 525-240.000.

Hashidate, Yuji: *See*—
Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 5,066,101, Cl. 359-638.000.

Hashimoto, Ryuji: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.

Hasiuk, Aaron S. Disposable litter container. 5,065,702, Cl. 119-168.000.

Hata, Kazutoshi: *See*—
Nishikawa, Seigo; Okumura, Shinji; Amano, Tadayuki; and Hata, Kazutoshi, 5,066,848, Cl. 219-124.340.

Hatanaka, Setsumi: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Hatori, Masami, to Fuji Photo Film Co., Ltd. Optical spectrum analyzer. 5,066,126, Cl. 356-328.000.

Hatt, Walter, to Graphic Management Associates, Inc. Non-lap opener. 5,065,994, Cl. 270-55.000.

Hattori, Yumi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, 5,066,808, Cl. 514-231.500.

Haubach, Claus C. F.: *See*—
Cornelissen, Roger E.; Haubach, Claus C. F.; and Blanco, Agustin R., 5,065,868, Cl. 206-494.000.

Hausler, Dominik: *See*—
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Havas, Laszlo: *See*—
Dumain, Andre; Engel, Jean; and Havas, Laszlo, 5,066,736, Cl. 526-82.000.

Hawes, Robert E., Jr.; Dellacroce, Cheryl; Aaldenberg, Eric; and Lynch, James J., to Esselte Pendaflex Corporation. Hanging laminated folder. 5,066,045, Cl. 281-45.000.

Hawryszkow, Michael G.: *See*—
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Dajih; and Hawryszkow, Michael G., 5,065,679, Cl. 105-3.000.

Hawthorne, M. Frederick, to Univ. of California, The Regents of the. Metallacarborane chelates. 5,066,479, Cl. 424-1.100.
Haxell, John P. N.: *See*—
Brown, Edward A.; Haxell, John P. N.; and Wilson, Derek E., 5,066,332, Cl. 106-31.000.
Hayama, Masahiro: *See*—
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Hayashi, Akimine: *See*—
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Hayashi, Hirofumi; and Matsumoto, Yo, to Toyo Tire & Rubber Company, Limited. Rubber composition for tire treads. 5,066,702, Cl. 524-426.000.
Hayashi, Kazutoshi, to Brother Kogyo Kabushiki Kaisha. Thread trimmer mechanism for sewing machines. 5,065,683, Cl. 112-292.000.
Hayashi, Masaaki: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.
Hayashi, Shunji; Yamanaka, Satoshi; Kawaguchi, Sayoko; Ishii, Teruhiko; Kimata, Toshiya; and Misu, Naoaki, to SDS Biotech K.K. Crotonic acid amide derivatives and insectides containing the same. 5,066,657, Cl. 514-269.000.
Hayashi, Tsutomu: *See*—
Nakajima, Yoshihiro; Saito, Mitsuru; Hayashi, Tsutomu; Tsunoda, Tadashi; Yamazaki, Katsumi; Yoshida, Yoshihiro; and Nakamura, Kazuhiko, 5,065,578, Cl. 60-464.000.
Hayden, Jack W.: *See*—
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Hayden, Terry F.; Hicks, Christopher A.; Ledermann, Peter G.; Nguyne, Alvin D.; Steinbach, Stephen C.; and Yu, Stanley K., to International Business Machines Corporation. Solder placement nozzle with inert cover gas and inert gas bleed. 5,065,932, Cl. 228-55.000.
Hayduk, Edward A., Jr.: *See*—
Zurecki, Zbigniew; Hayduk, Edward A., Jr.; North, John G.; and Swan, Robert B., 5,066,513, Cl. 427-37.000.
Hayes, James K., to Combustion Engineering, Inc. Quantifying isolation valve leakage. 5,067,094, Cl. 364-510.000.
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Hazan, Isidor; and Nordstrom, John D., to Du Pont de Nemours, E. I., and Company. Coating composition of an acrylic polymer, a cross-linking agent and a silane oligomer. 5,066,698, Cl. 524-269.000.
Heck, John A.; and Wilhelm, H. Randall, to Kaydon Corporation. Gas face seal. 5,066,026, Cl. 277-96.100.
Heckett Holland B.V.: *See*—
Groothoff, Jan A., 5,066,322, Cl. 75-255.000.
Heffner, Joseph H.: *See*—
Seener, G. Thomas; and Heffner, Joseph H., 5,065,595, Cl. 62-212.000.
Hefner, Robert E., Jr.; Puckett, Paul M.; and Earls, Jimmy D., to Dow Chemical Company, The. Vinyl ester resins containing mesogenic/-rigid rodlike moieties. 5,066,750, Cl. 526-273.000.
Heidelberger Druckmaschinen AG: *See*—
Reponty, Andre , 5,065,993, Cl. 270-49.000.
Heiden, Gene: *See*—
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Helwig, Reinhard; and Hoch, Helmut, to BASF Aktiengesellschaft. Process for the preparation of 1-amino-2-carboxyanthraquinones. 5,066,820, Cl. 522-249.000.
Hemenway, Carl P.: *See*—
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Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, 5,066,427, Cl. 260-413.000.
Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., to AMP Incorporated. Generating electromagnetic fields in a self regulating temperature heater by positioning of a current return bus. 5,065,501, Cl. 29-611.000.
Henson, Anthony E., to Albion Hat & Cap Company Pty., Ltd. Body protector. 5,065,457, Cl. 2-2.000.
Heppenstall, Neil G.; Betts, Colin; and Ford, James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the. Nuclear fuel assembly coolant control. 5,066,453, Cl. 376-352.000.
Herberts GmbH: *See*—
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Herbruck, Steven L.: *See*—
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Herbst, Barbara A.: *See*—
Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., 5,066,482, Cl. 424-45.000.
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Hernick, Mark R.: *See*—
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Hess, Robert L., to Progressive Angioplasty Systems, Inc. Article and method of sheathing angioplasty balloons. 5,066,298, Cl. 606-194.000.
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Firooz, Kamran, 5,066,909, Cl. 324-158.00R.
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Hill, Geoffrey E. Passive atmospheric liquid water measuring system and process. 5,065,615, Cl. 73-29.010.
Hille, Hans-Dieter; and Dobbelstein, Arnold, to BASF Lacke & Farben AG. Process for the preparation of macromonomers and macromonomers prepared by this process. 5,066,759, Cl. 528-60.000.
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Hills, Robert G., to Eastman Kodak Company. Electrical connector apparatus for use with an integrated circuit card. 5,066,241, Cl. 439-260.000.
Hillstead, Richard A., to Cordis Corporation. Catheter introducer sheath made of expanded polytetrafluoroethylene. 5,066,285, Cl. 604-164.000.

Hiney, Leonard L.: *See*—
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Hingorani, Rajesh: *See*—
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Hirai, Junichi: *See*—
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Hirano, Akira, to Asahi Glass Company, Ltd. Combiner for head-up display and glass with durable reflective coating. 5,066,102, Cl. 359-630.000.

Hirano, Kazuo: *See*—
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Horibe, Kinya; Hirano, Tomio; and Ikeda, Minoru, 5,066,550, Cl. 428-670.000.

Hiraoka, Saburo; and Niikawa, Kenji, to Mitsubishi Rayon Co., Ltd. Preparation method of spherical melamine resin particulates having crosslinked structure. 5,066,768, Cl. 528-230.000.

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Hirosawa, Hitoshi: *See*—
Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, 5,066,344, Cl. 156-138.000.

Hiroshi, Yamauchi: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Hirotaka Manufacturing Co., Ltd.: *See*—
Kimura, Takashi, 5,065,665, Cl. 91-433.000.

Hirschberg, Jakub; and Svensson, Bengt, to Siemens Aktiengesellschaft. Implantable injection body. 5,066,278, Cl. 604-256.000.

Hirzel, Edgar A.: *See*—
Betton, Arnold L.; and Hirzel, Edgar A., 5,066,905, Cl. 324-133.000.

Hisatomi, Masumi: *See*—
Tsuchiya, Toshio; Abe, Mitsuo; Arai, Nobuo; Hisatomi, Masumi; and Zama, Hideo, 5,067,038, Cl. 360-107.000.

Hishida, Satoshi: *See*—
Omure, Yukio; Fujiwara, Katsuki; Tsuchiya, Tatsumi; Hishida, Satoshi; Noguchi, Masahiro; and Yamamoto, Ikuo, 5,066,410, Cl. 252-68.000.

Hitachi Chemical Co., Ltd.: *See*—
Kumakura, Toshihisa; Nanaumi, Ken; Ikezawa, Ryoichi; and Eriguchi, Hideki, 5,066,691, Cl. 523-438.000.
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.

Hitachi, Ltd.: *See*—
Hosobuchi, Yoshiyuki; and Takahashi, Takayuki, 5,067,154, Cl. 380-25.000.
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,067,068, Cl. 395-650.000.
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.
Ozawa, Tsugutaro, 5,067,036, Cl. 360-96.500.
Sugano, Minoru; Horiki, Akira; Yashiro, Zenichi; and Matsushima, Hironori, 5,067,075, Cl. 395-425.000.
Tsuchiya, Toshio; Abe, Mitsuo; Arai, Nobuo; Hisatomi, Masumi; and Zama, Hideo, 5,067,038, Cl. 360-107.000.
Yamazaki, Hideki; Takeda, Hiroshi; and Yokota, Yoshikazu, 5,067,097, Cl. 395-115.000.
Yoshida, Takahoko; Muranaka, Masayuki; Yoshikawa, Hiroki; Hirata, Koji; Yoshizaki, Isao; Teratani, Masakuni; and Konuma, Nobuhiro, 5,066,099, Cl. 359-457.000.

Hitachi Maxell, Ltd.: *See*—
Yamauchi, Satoru, 5,067,120, Cl. 369-59.000.
Yanaka, Yoshimi; and Miyamoto, Keiji, 5,067,008, Cl. 357-81.000.

Hitachi Metals, Ltd.: *See*—
Kubo, Yutaka; and Hara, Hisao, 5,066,423, Cl. 252-516.000.

Hitachi Seiko Ltd.: *See*—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 5,066,171, Cl. 408-1.00R.

Hitachi VLSI Engineering Corp.: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.

Hitchcox Targets Limited: *See*—
Dean, William R.; and Waters, John H., 5,066,019, Cl. 273-348.100.

Hiyoshi, Tatsuo: *See*—
Miyazaki, Makoto; and Hiyoshi, Tatsuo, 5,066,682, Cl. 521-27.000.

Ho, Cheng W. Worktable. 5,065,989, Cl. 269-139.000.

Ho, Kuo-Chuan: *See*—
Singleton, David E.; Ho, Kuo-Chuan; and Greenberg, Charles B., 5,066,111, Cl. 359-275.000.

Hobbs, Sheila H.; and Johnson, Stephen J., to Warner-Lambert Company. Substituted oxazolidin-2-ones and 1,2,4-oxadiazolin-5-ones and derivatives thereof acting at muscarinic receptors. 5,066,662, Cl. 514-364.000.

Hobbs, Sheila H., to Warner-Lambert Company. Substituted-heterocyclopentanones and cyclopentenones and derivatives thereof acting at muscarinic receptors. 5,066,663, Cl. 514-326.000.

Hobbs, Sheila H., to Warner-Lambert Co. Substituted isoxazolidin-3-ones and derivatives thereof acting at muscarinic receptors. 5,066,665, Cl. 514-380.000.

Hocfbaum, Gerald E., Jr. Oil filter wrench. 5,065,648, Cl. 81-64.000.

Hoch, Helmut: *See*—
Helwig, Reinhard; and Hoch, Helmut, 5,066,820, Cl. 522-249.000.

Hochfeld, Stanley: *See*—
Johnson, Gary D.; and Hochfeld, Stanley, 5,065,779, Cl. 135-33.700.

Hodges, Hency C., Sr.; Hodges, Henry C., Jr.; Ashmore, Sam C.; and Piersol, Allan G., to Hodges Transportation Inc. Method and apparatus for determining terrain surface profiles. 5,065,618, Cl. 73-146.000.

Hodges, Henry C., Jr.: *See*—
Hodges, Hency C., Sr.; Hodges, Henry C., Jr.; Ashmore, Sam C.; and Piersol, Allan G., 5,065,618, Cl. 73-146.000.

Hodges, Marvin P. High refraction index enveloping medium lens system. 5,066,114, Cl. 359-665.000.

Hodges Transportation Inc.: *See*—
Hodges, Hency C., Sr.; Hodges, Henry C., Jr.; Ashmore, Sam C.; and Piersol, Allan G., 5,065,618, Cl. 73-146.000.

Hoebel, Peter: *See*—
Brandner, Gerhard; and Hoebel, Peter, 5,066,864, Cl. 250-484.100.

Hoechst AG: *See*—
Honel, Michael; Ziegler, Peter; Sprenger, Walter; and Wendt, Wolfgang, 5,066,758, Cl. 528-45.000.

Hoechst Aktiengesellschaft: *See*—
Dany, Franz-Josef; Ulrich, Hannsjorg; and Westermann, Lothar, 5,066,415, Cl. 252-135.000.
Feldhues, Michael; Kampf, Gunther; and Mecklenburg, Thomas, 5,066,731, Cl. 525-417.000.
Gerdau, Thomas; Kleiner, Hans-Jerg; Peuckert, Marcellus; Bruck, Martin; and Aldinger, Fritz, 5,066,623, Cl. 501-97.000.
Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, 5,066,567, Cl. 430-325.000.
Rieper, Wolfgang; and Hafner, Otmar, 5,066,687, Cl. 523-205.000.
Roscher, Gunter; Schmidt, Karl-Heinz; Eichler, Klaus; Horstermann, Peter; Gradl, Reinhard; and Langner, Horst, 5,066,365, Cl. 203-042.000.
Zertani, Rudolf; Mohr, Dieter; and Rode, Klaus, 5,066,564, Cl. 430-284.000.

Hoechst Celanese Corporation: *See*—
Pampalone, Thomas R., 5,066,561, Cl. 430-169.000.
Sandor, Robert B.; and Thornburg, Theodore S., 5,066,697, Cl. 524-233.000.

Hoefer, Clovia: *See*—
Hoefer, Richard; and Hoefer, Clovia, 5,065,923, Cl. 220-694.000.

Hoefer, Richard; and Hoefer, Clovia. Food supporting element for attachment to a food container. 5,065,923, Cl. 220-694.000.

Hoefle, Milton L.: *See*—
Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 5,066,668, Cl. 514-384.000.

Hoehst Celanese Corporation: *See*—
Hsieh, Shane; and Mitchell, Wayne A., 5,066,568, Cl. 430-325.000.

Hoffend, Thomas R.: *See*—
Robinette, Susan; Lynch, Anita P.; Hoffend, Thomas R.; Grabowski, Edward F.; and Carmichael, Kathleen M., 5,066,557, Cl. 430-58.000.

Hoffman, David R.: *See*—
Block, Michael S.; and Hoffman, David R., 5,066,224, Cl. 433-7.000.

Hoffman, Julie F.; and Jones, Lionel D., II, to Akzo N.V. Method for cleaning reagent delivery probes. 5,066,336, Cl. 134-22.120.

Hoffmann-La Roche Inc.: *See*—
Okabe, Masami, 5,066,800, Cl. 540-471.000.

Hoffmeyer, Mark K.: *See*—
Perepezko, John H.; and Hoffmeyer, Mark K., 5,066,324, Cl. 75-335.000.

Hofmann-Moritz, Doris: *See*—
Voss, Erdmuthe; Moschinsky, Werner; and Hofmann-Moritz, Doris, 5,066,640, Cl. 512-21.000.

Hofmeister, Peter: *See*—
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

Hogan, Mark R.: *See*—
Amr, Yehia M.; Fallows, W. Joseph, III; and Hogan, Mark R., 5,066,194, Cl. 415-223.000.

Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., to ZYP Coatings. Paintable compositions for protecting metal and ceramic substrates. 5,066,330, Cl. 106-287.340.

Holdeman, Maynard L., to A.B. Chance Company. Cylindrical foundation support drivable into ground with removable helix. 5,066,168, Cl. 405-249.000.

Holder, Jon A. Visually enhanced weather vane apparatus. 5,065,621, Cl. 73-188.000.

Hollerbach, Eric T.: *See*—
DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.

Hollesen, David B.; Kaczorek, Joseph W.; and Treible, Edwin S., to AT&T Bell Laboratories. Solder flux applicator. 5,065,692, Cl. 118-302.000.

Hollingsworth, Michele D.: *See*—
Hubbard, Ernest T.; Hollingsworth, Michele D.; Ram, N. V. Raghava; and Cook, Judith P., 5,066,595, Cl. 435-240.450.

Holmes, Donald E.: *See*—
Isaacson, Milton S.; Holmes, Donald E.; and Lioi, Anthony P., 5,066,300, Cl. 623-3.000.

Holmes, Thomas F.: *See*—
Breeden, Robert L.; Johnson, Richard E.; Kabcenell, Amy R.; and Holmes, Thomas F., 5,066,949, Cl. 340-825.440.

Hologic, Inc.: *See*—
Aitkenhead, William F.; and Gershman, Russell J., 5,067,144, Cl. 378-146.000.

Holt, John C.: *See*—
Huang, Tur-Fu; Niewiarowski, Stefan; Holt, John C.; and Lukasiewicz, Hanna, 5,066,592, Cl. 435-240.200.

Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Heribert; and Rump, Hanns, to Holter, Heinz. Apparatus for indicating the presence of toxic substances in air that is supplied to a personnel-occupied space. 5,066,466, Cl. 422-98.000.

Holtz, Leonard: *See*—
Johnson, Gary D.; and Hochfeld, Stanley, 5,065,779, Cl. 135-33.700.

Hon, Clarence C., to Mobil Oil Corporation. Hydraulic platform and level correcting control system. 5,065,844, Cl. 187-17.000.

Honda Giken Kogyo K.K.: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujimoto, Sachito; and Koike, Yuzuru, 5,065,705, Cl. 123-41.150.
Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 5,065,836, Cl. 180-245.000.
Hirabayashi, Kazuo; Oono, Tetsuya; Akiyama, Eitetsu; Ishii, Yukihisa; Sekiya, Shigenobu; and Fujimura, Yuji, 5,065,834, Cl. 180-197.000.
Nakajima, Yoshihiro; Saito, Mitsuru; Hayashi, Tsutomu; Tsunoda, Tadashi; Yamazaki, Katsumi; Yoshida, Yoshihiro; and Nakamura, Kazuhiko, 5,065,578, Cl. 60-464.000.
Shimada, Toshio, 5,065,644, Cl. 74-603.000.
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, 5,066,039, Cl. 280-741.000.
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 5,065,507, Cl. 29-888.010.

Honda Giken Koyo Kabushiki Kaisha: *See*—
Ito, Yasutoshi; Kamiyama, Toshihiro; and Kawashima, Fuminori, 5,065,709, Cl. 123-90.150.

Honda, Ikuro: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, 5,066,808, Cl. 514-231.500.

Honda, Mamoru; and Shirato, Ken, to Aisin Seiki Kabushiki Kaisha. Oil sealing system for a turbo charger. 5,066,192, Cl. 415-112.000.

Honel, Michael; Ziegler, Peter; Sprenger, Walter; and Wendt, Wolfgang, to Hoechst AG. Carrier resin for pigment pastes, and its preparation and use. 5,066,758, Cl. 528-45.000.

Honeywell Inc.: *See*—
Bunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,066,614, Cl. 437-209.000.
Kau, Shing P., 5,067,084, Cl. 364-453.000.
Olson, David P.; and Werder, Jonathan C., 5,067,096, Cl. 364-517.000.
Spielberger, Richard K.; and Dunaway, Thomas J., 5,066,831, Cl. 174-52.400.
Waldrop, John L.; and Glover, Clarence B., 5,065,521, Cl. 33-361.000.

Hood, Harrison P., III: *See*—
Pazda, Robert J.; Clum, Kenneth L.; and Hood, Harrison P., III, 5,066,918, Cl. 324-452.000.

Hoopingarner, Brett R., to Hudson, E. W., III. Method and apparatus for allocating and recording time blocks on VCR tapes. 5,066,046, Cl. 283-70.000.

Hope, Henry F.; and Hope, Stephen F. Fire and moisture proof anode construction for alkaline metal or alkaline earth metal batteries. 5,066,554, Cl. 429-48.000.

Hope, Stephen F.: *See*—
Hope, Henry F.; and Hope, Stephen F., 5,066,554, Cl. 429-48.000.

Hopperdietzel, Siegfried, to Rehau AG & Co. Tambour door for box-type furniture. 5,065,808, Cl. 160-231.200.

Hoppner, Klaus: *See*—
Wehle, Anton; Hoppner, Klaus; and Weiss, Hermann, 5,065,708, Cl. 123-52.0MC.

Hori, Roy Y.: *See*—
Crowninshield, Roy D.; and Hori, Roy Y., 5,066,304, Cl. 623-22.000.

Horibe, Kinya; Hirano, Tomio; and Ikeda, Minoru, to Yazaki Corporation. Electric contact. 5,066,550, Cl. 428-670.000.

Horiki, Akira: *See*—
Sugano, Minoru; Horiki, Akira; Yashiro, Zenichi; and Matsushima, Hironori, 5,067,075, Cl. 395-425.000.

Horn, Michael: *See*—
Hadcock, Richard N.; Chipman, Richard R.; Horn, Michael; and Chance, Richard F., 5,065,630, Cl. 73-802.000.

Horner, Tom. Splash resistant cup lid. 5,065,880, Cl. 220-711.000.

Horstermann, Peter: *See*—
Roscher, Gunter; Schmidt, Karl-Heinz; Eichler, Klaus; Horstermann, Peter; Gradl, Reinhard; and Langner, Horst, 5,066,365, Cl. 203-042.000.

Hosaka, Yukihiro: *See*—
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, 5,065,598, Cl. 62-330.000.

Hoshi, Hideaki: *See*—
Ohnuma, Takeshi; Hoshi, Hideaki; Kamei, Hideo; and Naito, Takayuki, 5,066,645, Cl. 514-27.000.

Hosobuchi, Yoshiyuki; and Takahashi, Takayuki, to Hitachi, Ltd. Terminal management method and apparatus. 5,067,154, Cl. 380-25.000.

Hosokai, Tetsushi; Takaba, Tetsuro; Ishihara, Toshihiro; and Kobayashi, Hideki, to Mazda Motor Corporation. Idle speed control system for engine. 5,065,717, Cl. 123-339.000.

Hosono, Masaki: *See*—
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.

Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, to Kabushiki Kaisha Toshiba; and Tokyo Electric Co., Ltd. Cleaner-less image forming apparatus. 5,066,982, Cl. 355-269.000.

Houki, Yoji: *See*—
Watarai, Shinichi; Yasuda, Megumi; Houki, Yoji; and Nishio, Yukio, 5,066,978, Cl. 355-206.000.

Houle, William A.; Larson, James R.; and Pearlstine, Kathryn A., to DXImaging. Process for preparing positive electrostatic liquid developers with acidified charge directors. 5,066,821, Cl. 430-137.000.

Hounsel, Mack A., to J T Thorpe Company. Refractory ceramic fiber ladle covers. 5,065,987, Cl. 266-283.000.

Howard, James K.; Simmons, Randall G.; and Yogi, Tadashi, to International Business Machines Corporation. Low noise thin film metal alloy magnetic recording disk. 5,066,552, Cl. 428-694.000.

Howard, Richard E.: *See*—
Denker, John S.; Howard, Richard E.; Jackel, Lawrence D.; and LeCun, Yann, 5,067,164, Cl. 382-15.000.

Howie, Milham S.: *See*—
Sangokoya, Samuel A.; Howie, Milham S.; and Trumbo, Todd A., 5,066,631, Cl. 502-152.000.

Howland, Leland L.; Parker, Jan M.; Herrig, Doyle G.; and Swanson, David A., to Thermo King Corporation. Compartmentalized transport refrigeration system. 5,065,587, Cl. 62-131.000.

Hoya Corporation: *See*—
Kasuga, Tomoko; and Kasuga, Toshihiro, 5,066,619, Cl. 501-3.000.

Hrsak, Ivo: *See*—
Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, 5,066,642, Cl. 514-18.000.

Hsiao, Chang-Chia: *See*—
Chan, Yiu-Fai; Hsiao, Chang-Chia; and Watson, James A., 5,066,873, Cl. 307-443.000.

Hsieh, Dick M. Briefcase formed with thermoformed laminate shells. 5,065,847, Cl. 190-125.000.

Hsieh, Henry L.: *See*—
Pettijohn, Ted M.; and Hsieh, Henry L., 5,066,739, Cl. 526-127.000.

Hsieh, Shane; and Mitchell, Wayne A., to Hoehst Celanese Corporation. Method of developing negative working photographic elements. 5,066,568, Cl. 430-325.000.

Hsu, Jack J.: *See*—
Huang, Wann-Sheng; and Hsu, Jack J., 5,065,821, Cl. 166-245.000.

Hsu, P. J. Structure of permanent magnetic work holder. 5,066,936, Cl. 335-295.000.

Huang, Lai-Jen. Combined negative holder and viewing device. 5,066,158, Cl. 402-4.000.

Huang, Tur-Fu; Niewiarowski, Stefan; Holt, John C.; and Lukasiewicz, Hanna, to Temple University of the Commonwealth System of Higher Education. Trigramin - a platelet aggregation inhibiting polypeptide. 5,066,592, Cl. 435-240.200.

Huang, Wann-Sheng; and Hsu, Jack J., to Texaco Inc. Gas flooding with horizontal and vertical wells. 5,065,821, Cl. 166-245.000.

Hubbard, Ernest T.; Hollingsworth, Michele D.; Ram, N. V. Raghava; and Cook, Judith P., to Sungene Technologies Corporation. Process

for increasing free pool lysine content in maize. 5,066,595, Cl. 435-240.450.

Hubbell Incorporated: *See*—
Kesler, Gregory J.; and Schnell, Kenneth R., 5,065,968, Cl. 248-205.100.

Huber, Charles D.; and Barry, Donald J., to Minnesota Mining and Manufacturing Company. Camouflage wrapping tape. 5,066,529, Cl. 428-40.000.

Huber, Werner; and Spiegel, Guenter, to Robert Bosch GmbH. Apparatus having a control motor for intervention into a force transmission device. 5,065,722, Cl. 123-399.000.

Huder, Bernhard, to Telefunken Systemtechnik GmbH. Mode coupler for monopulse applications having H_{01} mode extracting means. 5,066,959, Cl. 343-786.000.

Hudson, E. W., III: *See*—
Hoopingarner, Brett R., 5,066,046, Cl. 283-70.000.

Huels Aktiengesellschaft: *See*—
Flakus, Werner, 5,066,713, Cl. 524-591.000.
Ruff, Klaus; Falk, Bernhard; and Gratz, Werner, 5,066,472, Cl. 423-342.000.

Huerre, Dominique; and Mehu, Jacques, to Societe Electronique de la Region Pays de Loire. Television set fascia. 5,067,022, Cl. 358-248.000.

Huettenhain, Horst; Benz, August D.; and Getsoian, John, to Bechtel Group, Inc.; and Arcanum Corp. Method for recovering light hydrocarbons from coal agglomerates. 5,066,310, Cl. 44-500.000.

Huff, Terrence: *See*—
Randall, James C., Jr.; and Huff, Terrence, 5,066,723, Cl. 525-194.000.

Huffy Corporation: *See*—
Niver, Michael A., 5,066,007, Cl. 273-1.50R.

Hughes Aircraft Company: *See*—
McDonald, Mark E., 5,066,108, Cl. 359-65.000.
Woody, George, 5,065,976, Cl. 248-549.000.

Hulsing, Rand H., II., to Sundstrand Data Control, Inc. Apparatus and method for sensing displacement using variations magnetic flux linkage. 5,066,911, Cl. 324-207.180.

Hundleby, Giles E., to Ricardo Group PLC. Internal combustion engines. 5,065,712, Cl. 123-188.00M.

Hunke, Friedrich, to Automatik Apparate-Maschinenbau GmbH. Apparatus for cooling and granulating extrusions of thermoplastic material. 5,066,210, Cl. 425-71.000.

Hunt, Gary D.: *See*—
Reid, Laurie M.; Koster, Archie; and Hunt, Gary D., 5,065,856, Cl. 198-419.300.

Hutt, Julie A.: *See*—
Palepu, Nageswara R.; and Hutt, Julie A., 5,066,647, Cl. 514-110.000.

Huttemann, Lyndon R.: *See*—
Long, Michael; Huttemann, Lyndon R.; Sanford, Robert W.; and Longboat, Robert D., 5,066,345, Cl. 156-157.000.
Long, Michael; Huttemann, Lyndon R.; and Sanford, Robert W., 5,066,346, Cl. 156-157.000.

Hutter, G. Frederick, to Westvaco Corporation. Water-soluble rosin polyamide resins. 5,066,331, Cl. 106-30.000.

Huykman, William, to Ultrafibre, Inc. Nonwoven insulating webs. 5,066,538, Cl. 428-288.000.

Hwang, Bor-Yuan: *See*—
Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., 5,067,002, Cl. 357-59.000.

Hwang, Steven. Aquarium ornament lamp source. 5,067,059, Cl. 362-101.000.

Hwo, Charles C., to Shell Oil Company. Film, sheet and laminate capable of forming easy-open packagings. 5,066,543, Cl. 428-412.000.

Hyland, Barry M.: *See*—
Tarzwell, John W.; Tarzwell, Patrick J.; Myers, Theodore R.; Hyland, Barry M.; Dahl, John C.; and Eddings, Jack L., 5,066,907, Cl. 324-158.00P.

Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, to Fujitsu Limited. System for controlling data transmission in ATM switching network. 5,067,123, Cl. 370-58.100.

Hyperfine, Inc.: *See*—
Schwenker, John P., 5,066,127, Cl. 356-328.000.

Hyster Company: *See*—
Axtell, Lloyd L., 5,065,643, Cl. 74-501.600.

Hyundai Electronics Industries Co., Ltd.: *See*—
Chung, In S.; and Lee, Dai H., 5,066,604, Cl. 437-44.000.

I F M Electronic GmbH: *See*—
Burgel, Johannes; and Lamarche, Jean L., 5,066,954, Cl. 341-158.000.

Ichihashi, Hiroshi: *See*—
Kitamura, Masaru; Ichihashi, Hiroshi; and Suzukamo, Gohfu, 5,066,630, Cl. 502-85.000.

Ichijima, Seiji; Saito, Naoki; Mihayashi, Keiji; Ishii, Yoshio; and Ogawa, Akira, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,066,576, Cl. 430-558.000.

Ichikoh Industries Ltd.: *See*—
Akizuki, Kunio, 5,067,053, Cl. 362-61.000.

Ichimatsu, Tsuneo: *See*—
Sunahara, Kazuo; Ichimatsu, Tsuneo; and Aoki, Yumiko, 5,066,620, Cl. 501-21.000.

Ida, Shizuo, to Mitsubishi Denki Kabushiki Kaisha. Head driver. 5,067,032, Cl. 360-46.000.

Ide, Russell D. Hydrodynamic bearings having a continuous beam mounted support surface. 5,066,144, Cl. 384-117.000.

Idel, Karsten-Josef: *See*—
Russeler, Wolfgang; Idel, Karsten-Josef; Dorf, Ernst-Ulrich; Alewelt, Wolfgang; and Freitag, Dieter, 5,066,776, Cl. 528-388.000.

Identix Incorporated: *See*—
Driscoll, Edward C., Jr.; Martin, Craig O.; Ruby, Kenneth; Russell, James J.; and Watson, John G., 5,067,162, Cl. 382-5.000.

Iderosa, Richard A., to Warner-Lambert Company. Thermally assisted shaving system. 5,065,515, Cl. 30-140.000.

Iehisa, Nobuaki: *See*—
Yamazaki, Etsuo; and Iehisa, Nobuaki, 5,067,086, Cl. 364-474.080.

Ifflaender, Helmut; Matura, Eike; Polster, Walter; and Rattner, Manfred, to Siemens Aktiengesellschaft. Extracorporeal lithotripsy apparatus for the disintegration of calculi having an unattenuated locating field. 5,065,762, Cl. 128-660.030.

Igaki, Masahiko: *See*—
Kataoka, Kenichi; Nishimoto, Yoshifumi; Igaki, Masahiko; and Yanagi, Eiichi, 5,065,999, Cl. 271-265.000.

Igelbuscher, Heinrich: *See*—
Holter, Heinz; Igelbuscher, Heinrich; Gresch, Heinrich; Dewert, Heribert; and Rump, Hanns, 5,066,466, Cl. 422-98.000.

Iguchi, Yasuyuki: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.

Ihara, Takeshi: *See*—
Hamano, Hiroshi; Amemiya, Izumi; Yamamoto, Takuji; Arai, Yasunari; and Ihara, Takeshi, 5,066,877, Cl. 307-603.000.

Iijima, Tatsuya: *See*—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,067,131, Cl. 371-40.100.

Ikeda, Hideaki: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Ikeda, Makoto; and Toriumi, Makoto, to Terumo Kabushiki Kaisha. Electronic clinical thermometer. 5,066,141, Cl. 374-169.000.

Ikeda, Minoru: *See*—
Horibe, Kinya; Hirano, Tomio; and Ikeda, Minoru, 5,066,550, Cl. 428-670.000.

Ikeda, Yukio, to Niles Parts Co., Ltd. Exhaust gas purifying apparatus. 5,066,316, Cl. 55-122.000.

Ikeuchi, Masaki: *See*—
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, 5,065,598, Cl. 62-330.000.

Ikezawa, Ryoichi: *See*—
Kumakura, Toshihisa; Nanaumi, Ken; Ikezawa, Ryoichi; and Eriguchi, Hideki, 5,066,691, Cl. 523-438.000.

Ikezi, Hiroyuki; Lin-Liu, Yuh-Ren; and deGrassie, John S., to General Atomics. Soliton pulse compressor. 5,066,928, Cl. 333-20.000.

Imai, Takehiro: *See*—
Nakagawa, Shiro; Domon, Taisuke; Imai, Takehiro; and Tsuchida, Atsuko, 5,065,625, Cl. 73-336.500.

Imaoka, Kazunori: *See*—
Miura, Takao; and Imaoka, Kazunori, 5,066,993, Cl. 357-23.700.

IMC Fertilizer, Inc.: *See*—
Michalski, Dennis H., 5,066,471, Cl. 423-319.000.

Imperial Chemical Industries PLC: *See*—
Cogswell, Frederic N.; and Meakin, Peter J., 5,066,536, Cl. 428-216.000.

Imunoloski Zavod: *See*—
Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, 5,066,642, Cl. 514-18.000.

Inagaki, Masaru; and Matsushita, Toshio, to NEC Corporation. Telephone handset with electrostatic discharge prevention. 5,067,151, Cl. 379-433.000.

Inamed Corporation: *See*—
Cox, James E., Jr., 5,065,772, Cl. 128-836.000.

Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, to Nitta Industries Corporation. Process for producing an endless belt. 5,066,344, Cl. 156-138.000.

Inazawa, Yoshizumi: *See*—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,067,131, Cl. 371-40.100.

Industrial Materials Technology, Inc.: *See*—
Hanson, Andrew D., 5,066,454, Cl. 419-42.000.

Industrial Technology Research Institute: *See*—
Liu, Ru-Shi; Wang, Wang-Nang; and Chang, Chan-Ting, 5,066,636, Cl. 505-1.000.
Wang, Jinn-Shyan, 5,067,016, Cl. 358-140.000.
Yo, Yuh-Yuan, 5,065,594, Cl. 62-195.000.

Information Technologies Research, Inc.: *See*—
Kisor, Gregory H.; and King, Edward J., 5,067,152, Cl. 380-10.000.

Ingalls, Robert A., to Excet Corporation. Screw rotor lobe profile for simplified screw rotor machine capacity control. 5,066,205, Cl. 418-1.000.

Ingenhoven, Jurgen, to Kiekert GmbH & Kommanditgesellschaft. Motor-vehicle door latch with antitheft feature. 5,066,054, Cl. 292-201.000.

Inoue, Hiroshi: *See*—
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,066,945, Cl. 340-784.000.

Inoue, Katsuhiro: *See*—
Kato, Shigeki; and Inoue, Katsuhiro, 5,066,449, Cl. 264-406.000.
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, to Sony Corporation. Magnetic recording medium wherein the magnetic layer contains components having specified polar groups, particle diameters and surface areas or which are in specific relative ratios. 5,066,539, Cl. 428-328.000.
Inoue, Masahiro: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.
Inoue, Shigeru: *See*—
Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, 5,065,985, Cl. 266-156.000.
Inoue, Takahiro: *See*—
Goto, Masahiro; Inoue, Takahiro; Kato, Junichi; and Kobayashi, Tatsuya, 5,066,979, Cl. 355-208.000.
Inoue, Takashi: *See*—
Mizuno, Toshio; Muratani, Takuro; Ito, Yasuhiko; Watanabe, Tatsuo; and Inoue, Takashi, 5,066,957, Cl. 342-352.000.
Inoue, Takayoshi: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.
Inoue, Yoshio; Yoshino, Masachika; and Fujiki, Hironao, to Shin-Etsu Chemical Co., Ltd. Curable organopolysiloxane putty-like composition. 5,066,714, Cl. 524-731.000.
Insite Peripherals, Inc.: *See*—
Godwin, Jimmy D.; and Williams, Stephen P., 5,067,039, Cl. 360-135.000.
Institut Francais du Petrole: *See*—
Bardin, Christian; Pignard, Guy; Boulet, Jean; and Morin, Pierre, 5,065,825, Cl. 175-38.000.
Institut Pasteur: *See*—
Montagnier, Luc; Chamaret, Solange; Guetard, Denise; Alizon, Marc; Clavel, Francois; Guyader, Mireille; Sonigo, Pierre; Brun-Vezinet, Francoise; Rey, Marianne; Rouzioux, Christine; and Katlama, Christine, 5,066,782, Cl. 530-324.000.
Institut Recherches de la Siderurgie Francais - IRSID: *See*—
Quantin, Daniele; and Galdon, Francisco, 5,066,548, Cl. 428-629.000.
Insul Company, Inc.: *See*—
Perri, Joseph A., 5,065,986, Cl. 266-217.000.
Intelectron: *See*—
Lee, Wade, 5,066,855, Cl. 250-221.000.
International Business Machines Corporation: *See*—
Akam, Nigel J.; Cameron, Donald M.; Halliday, David K.; and Paterson, Raymond, 5,065,858, Cl. 198-493.000.
Andreshak, Joseph C.; Datta, Madhav; Romankiw, Lubomyr T.; and Vega, Luis F., 5,066,370, Cl. 204-129.100.
Andrews, Paul N., 5,067,073, Cl. 395-375.000.
Borkenhagen, John M.; Schmierer, Quentin; and Geer, Charles P., 5,067,105, Cl. 395-400.000.
Cooke, Kevin K.; Dewitt, John R.; and McCloskey, John E., 5,067,041, Cl. 361-394.000.
Daley, Lawrence R.; and Leslie, Gerald G., II, 5,066,360, Cl. 156-660.000.
Evans, Timothy G.; Gould, Mark W.; and McNamara, Timothy J., 5,067,129, Cl. 371-16.100.
Goldowsky, Michael P.; and Pennebaker, William B., 5,066,512, Cl. 427-14.100.
Hayden, Terry F.; Hicks, Christopher A.; Ledermann, Peter G.; Nguyne, Alvin D.; Steinbach, Stephen C.; and Yu, Stanley K., 5,065,932, Cl. 228-55.000.
Howard, James K.; Simmons, Randall G.; and Yogi, Tadashi, 5,066,552, Cl. 428-694.000.
Ito, Nobuyasu, 5,067,166, Cl. 382-37.000.
Zammit, Robert P., 5,065,483, Cl. 29-603.000.
International Clamp Company: *See*—
Miller, Jack E., 5,066,053, Cl. 285-373.000.
International Flavors & Fragrances Inc.: *See*—
Narula, Anubhav P. S.; and DeVirgilio, John J., 5,066,639, Cl. 512-13.000.
Narula, Anubhav P. S.; De Virgilio, John J.; and Van Elst, Jan T., 5,066,641, Cl. 512-25.000.
International Group, Inc., The: *See*—
Colon, Herman; and Maletsky, Albert, 5,066,711, Cl. 524-556.000.
International Mobile Machine Corporation: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.
Inui, Masaki: *See*—
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.
Inventio AG: *See*—
Rulke, Gerhart, 5,067,062, Cl. 362-146.000.
Schroder, Joris, 5,065,846, Cl. 187-127.000.
Invequest, Inc.: *See*—
Farnsworth, Thomas L., 5,065,947, Cl. 241-30.000.
Ionics, Incorporated: *See*—
Parsi, Edgardo J.; Sims, Keith J.; Elyanow, Irving D.; and Prato, Thomas A., 5,066,375, Cl. 204-182.400.
Iovine, Carmine P.: *See*—
Leighton, John C.; Iovine, Carmine P.; Aronson, Michael P.; and Elliott, David L., 5,066,749, Cl. 526-271.000.
Isaacson, Milton S.; Holmes, Donald E.; and Lioi, Anthony P., to Nu-Tech Industries, Inc. Twin replacement heart. 5,066,300, Cl. 623-3.000.
Isaka, Kazuo: *See*—
Yoshinaga, Kazuo; Keneko, Shuzo; Kai, Takashi; Isaka, Kazuo; and Ohnishi, Toshikazu, 5,066,107, Cl. 359-45.000.
Isao, Sugiyama: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.
Isawa, Yamahiro; Morooka, Isao; and Oba, Yoichi, to Asahi Chemical Research Laboratory Co., Ltd. Electromagnetic wave shielding composition comprising epoxy resin and copper particles. 5,066,692, Cl. 523-458.000.
Ishak, Maher; and Schwartz, Alexander, to Abrasive Technology N.A., Inc. Flexible abrasives. 5,066,312, Cl. 51-295.000.
Ishibashi, Hiroshi: *See*—
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,067,131, Cl. 371-40.100.
Ishida, Kohji; Nishimura, Yasushi; and Yamaguchi, Shigeru, to Pioneer Electronic Corporation. Noise reduction apparatus in an FM stereo tuner. 5,067,157, Cl. 381-13.000.
Ishida, Masatoshi: *See*—
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.
Ishida, Noboru; Ito, Masaya; and Kawamura, Mitsuyoshi, to NGK Spark Plug Co., Ltd. Metal and ceramic heat-connected body. 5,066,547, Cl. 428-627.000.
Ishihara, Hideshi: *See*—
Mikami, Kazuo; Ishihara, Hideshi; Nishimura, Masahiro; Tsukiyama, Noriyuki; and Hinoda, Seisuke, 5,067,161, Cl. 382-1.000.
Ishihara, Kouichiro: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.
Ishihara, Sumi: *See*—
Umemoto, Teruo; and Ishihara, Sumi, 5,066,795, Cl. 540-1.000.
Ishihara, Toshihiro: *See*—
Hosokai, Tetsushi; Takaba, Tetsuro; Ishihara, Toshihiro; and Kobayashi, Hideki, 5,065,717, Cl. 123-339.000.
Ishii, Eiichi: *See*—
Fukuda, Shinri; and Ishii, Eiichi, 5,066,876, Cl. 307-475.000.
Ishii, Koji: *See*—
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.
Ishii, Satoshi; Tsukiji, Masaaki; Nishimura, Tetsuharu; and Ishizuka, Koh, to Canon Kabushiki Kaisha. Device having signal interpolation circuit and displacement measuring apparatus comprising the device. 5,067,089, Cl. 364-486.000.
Ishii, Satoshi: *See*—
Tsukiji, Masaaki; Nishimura, Tetsuharu; Ishizuka, Koh; Ishii, Satoshi; and Kubota, Yoichi, 5,066,130, Cl. 356-356.000.
Ishii, Teruhiko: *See*—
Hayashi, Shunji; Yamanaka, Satoshi; Kawaguchi, Sayoko; Ishii, Teruhiko; Kimata, Toshiya; and Misu, Naoaki, 5,066,657, Cl. 514-269.000.
Ishii, Yoshiki; and Shimokoriyama, Makoto, to Canon Kabushiki Kaisha. Color video signal processing device with encoding and compression. 5,067,010, Cl. 358-13.000.
Ishii, Yoshio: *See*—
Ichijima, Seiji; Saito, Naoki; Mihayashi, Keiji; Ishii, Yoshio; and Ogawa, Akira, 5,066,576, Cl. 430-558.000.
Ishii, Yukihisa: *See*—
Hirabayashi, Kazuo; Oono, Tetsuya; Akiyama, Eitetsu; Ishii, Yukihisa; Sekiya, Shigenobu; and Fujimura, Yuji, 5,065,834, Cl. 180-197.000.
Ishikawa, Takatoshi: *See*—
Yoshida, Kazuaki; and Ishikawa, Takatoshi, 5,066,571, Cl. 430-489.000.
Ishikawa, Yujiro: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,066,152, Cl. 400-621.000.
Ishizuka, Koh: *See*—
Ishii, Satoshi; Tsukiji, Masaaki; Nishimura, Tetsuharu; and Ishizuka, Koh, 5,067,089, Cl. 364-486.000.
Tsukiji, Masaaki; Nishimura, Tetsuharu; Ishizuka, Koh; Ishii, Satoshi; and Kubota, Yoichi, 5,066,130, Cl. 356-356.000.
Isoe, Hirosuke: *See*—
Motoda, Kenro; and Isoe, Hirosuke, 5,065,522, Cl. 33.1-366.000.
Isono, Osamu: *See*—
Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, 5,067,123, Cl. 370-58.100.

Isover Saint-Gobain: *See—*
Furtak, Hans; Naber, Wilfrid; and Lejeune, Raymond, 5,065,478, Cl. 19-296.000.

ISP Investments Inc.: *See—*
Helioff, Michael W.; Plochocka, Krystyna; and Tazi, Mohammed, 5,066,481, Cl. 424-47.000.
Merianos, John J.; Login, Robert B.; and Garelick, Paul, 5,066,488, Cl. 424-80.000.

Isuzu Motors Limited: *See—*
Matsuoka, Hiroshi, 5,065,714, Cl. 123-254.000.

Ito, Katsuhiro: *See—*
Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,066,105, Cl. 359-58.000.

Ito, Kenichi, to Nippon Thompson Co., Ltd. Method of manufacturing rod end joint. 5,065,934, Cl. 228-112.000.

Ito, Kenji; Shimizu, Hiroyuki; and Wakita, Naomasa, to NGK Spark Plug Co., Ltd. Method of adjusting a frequency response in a stripline filter device. 5,066,934, Cl. 333-205.000.

Ito, Makoto: *See—*
Suzuki, Takanori; and Ito, Makoto, 5,067,052, Cl. 362-61.000.

Ito, Masaya: *See—*
Ishida, Noboru; Ito, Masaya; and Kawamura, Mitsuyoshi, 5,066,547, Cl. 428-627.000.

Ito, Nobuyasu, to International Business Machines Corporation. Method and apparatus for DP matching using multiple templates. 5,067,166, Cl. 382-37.000.

Ito, Ryoji: *See—*
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 5,065,507, Cl. 29-888.010.

Ito, Shoji: *See—*
Hasebe, Noboru; and Ito, Shoji, 5,065,749, Cl. 128-664.000.

Ito, Takayuki: *See—*
Nakamura, Koki; Ito, Takayuki; Tsukase, Masaaki; and Taguchi, Toshiki, 5,066,577, Cl. 430-562.000.

Ito, Yasuhiko: *See—*
Mizuno, Toshio; Muratani, Takuro; Ito, Yasuhiko; Watanabe, Tatsuo; and Inoue, Takashi, 5,066,957, Cl. 342-352.000.

Ito, Yasutoshi; Kamiyama, Toshihiro; and Kawashima, Fuminori, to Honda Giken Koyo Kabushiki Kaisha. Valve operating system for internal combustion engine. 5,065,709, Cl. 123-90.150.

Itoh, Ayao, to Kabushiki Kaisha Toshiba. Ultrasonic medical treatment apparatus. 5,065,740, Cl. 128-24.0EL.

Itoh, Shigeo: *See—*
Morimoto, Kiyoshi; Itoh, Shigeo; Tonegawa, Takeshi; and Niiyama, Takahiro, 5,066,885, Cl. 313-340.000.

ITT Corporation: *See—*
Schap, William W., 5,066,056, Cl. 292-341.160.
Shiley, Robert J., 5,066,237, Cl. 439-82.000.
Welsh, David E., 5,066,250, Cl. 439-681.000.
Zoller, Jon P.; and Norris, Jeffrey J., 5,066,841, Cl. 200-342.000.

IVAC Corporation: *See—*
DeFrank, Michael P.; and Rosati, Robert J., 5,066,142, Cl. 374-208.000.

Iwabuchi, Eisuke: *See—*
Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, 5,067,123, Cl. 370-58.100.

Iwaguro, Kenichi: *See—*
Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, 5,066,384, Cl. 208-45.000.

Iwahashi, Hiroshi: *See—*
Asano, Masamichi; Iwahashi, Hiroshi; and Yokoyama, Sadayuki, 5,067,111, Cl. 365-189.080.

Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, to Sumitomo Metal Industries, Ltd.; Sumikin Chemical Co. Ltd.; and Kureha Kagaku Kogyo Kabushiki Kaisha. Process for refining coal-derived heavy carbonaceous materials. 5,066,384, Cl. 208-45.000.

Iwamoto, Ken; and Narukawa, Atsushi, to Sharp Kabushiki Kaisha. Sheet supplying device. 5,065,995, Cl. 271-9.000.

Iwamoto, Masayuki; Minami, Kouji; and Yamaoki, Toshihiko, to Sanyo Electric Co., Ltd. Photovoltaic device. 5,066,340, Cl. 136-258.000.

Iwanabe, Yoji: *See—*
Sato, Takashi; Iwanabe, Yoji; Arato, Koji; Sakagami, Rokuro; and Yoneda, Yasuo, 5,065,809, Cl. 164-61.000.

Iwanaga, Isao: *See—*
Nakashima, Shozaburo; Iwayama, Kenzo; and Iwanaga, Isao, 5,066,343, Cl. 148-111.000.

Iwasaki, Katsuhiro: *See—*
Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, 5,065,985, Cl. 266-156.000.

Iwasaki, Tameo; Sugiura, Masaki; Matsuoka, Yuzo; Matsumoto, Mamoru; and Kitamura, Kazuyuki, to Tanabe Seiyaku Co., Ltd. Benzofuran derivatives. 5,066,669, Cl. 514-449.000.

Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, to Hitachi, Ltd. Method for converting an iterative loop of a source program into parellelly executable object program portions. 5,067,068, Cl. 395-650.000.

Iwashita, Yuji: *See—*
Yabuki, Akira; and Iwashita, Yuji, 5,066,590, Cl. 435-180.000.

Iwata, Mikio; Kariya, Takao; and Ohtsuka, Masaru, to Canon Kabushiki Kaisha. Stage mechanism. 5,066,131, Cl. 356-401.000.

Iwayama, Kenzo: *See—*
Nakashima, Shozaburo; Iwayama, Kenzo; and Iwanaga, Isao, 5,066,343, Cl. 148-111.000.

J. P. Tool, Inc.: *See—*
Peuterbaugh, Bruce G., 5,066,178, Cl. 409-233.000.

J & S Medical Associates, Inc.: *See—*
Deutsch, Marshall E., 5,066,387, Cl. 209-5.000.

J. S. Staedtler GmbH & Co.: *See—*
Schmickl, Werner; and Meichsner, Roland, 5,066,329, Cl. 106-20.000.

J. T. Baker Inc.: *See—*
Ramsden, Hugh E.; and Nau, David R., 5,066,395, Cl. 210-198.200.

J T Thorpe Company: *See—*
Hounsel, Mack A., 5,065,987, Cl. 266-283.000.

J. W. Harris Co., Inc.: *See—*
Ballentine, Richard E.; and Harris, Joseph W., 5,066,456, Cl. 420-472.000.

J. Wagner GmbH: *See—*
Klingen, Willy, 5,066,518, Cl. 427-236.000.

Jackel, Lawrence D.: *See—*
Denker, John S.; Howard, Richard E.; Jackel, Lawrence D.; and LeCun, Yann, 5,067,164, Cl. 382-15.000.

Jackson, Aaron, Jr.: *See—*
Jackson, Efram W.; and Jackson, Aaron, Jr., 5,065,773, Cl. 128-876.000.

Jackson, Efram W.; and Jackson, Aaron, Jr. Weightlifter's belt. 5,065,773, Cl. 128-876.000.

Jackson, Kevin B., to Motorola, Inc. Semiconductor diode and method. 5,066,991, Cl. 357-13.000.

Jackson, Ronald M., to Tektronix, Inc. Method for acquiring data in a logic analyzer. 5,067,130, Cl. 371-22.100.

Jackson, Winston J., Jr.; and Darnell, William R., to Eastman Kodak Company. Process for the preparation of poly(ester-carbonates). 5,066,766, Cl. 528-190.000.

Jacobs, Albert L., Jr.: *See—*
Witkin, Roy T., 5,066,497, Cl. 424-616.000.

Jaecklin, Felix P.: *See—*
Gavin, Norman W.; and Jaecklin, Felix P., 5,066,169, Cl. 405-284.000.

Jakob, Wolfgang: *See—*
Dorf, Ernst-Ulrich; Reinking, Klaus; Jakob, Wolfgang; Tresper, Erhard; and Russeler, Wolfgang, 5,066,775, Cl. 528-388.000.

Jalett, Hans-Peter: *See—*
Blaser, Hans-Ulrich; Jalett, Hans-Peter; and Sedelmeier, Gottfried, 5,066,801, Cl. 540-523.000.

Jalota, Satish K.: *See—*
Pasqualoni, Anthony M.; Mahulikar, Deepak; Jalota, Satish K.; and Brock, Andrew J., 5,066,368, Cl. 204-58.000.

James, R. Steve: *See—*
Rioja, Roberto J.; Bowers, Joel A.; and James, R. Steve, 5,066,342, Cl. 148-12.70A.

James River Corporation: *See—*
Manning, James H., 5,066,348, Cl. 156-164.000.

James, Robert L.: *See—*
Miller, Ronald E.; and James, Robert L., 5,066,898, Cl. 315-362.000.

Jansen, Johannes W. C. M.: *See—*
Hamminga, Derk; van Wijngaarden, Ineke; and Jansen, Johannes W. C. M., 5,066,649, Cl. 514-183.000.

Janssen, Marcel A. C.: *See—*
Greco, Michael N.; and Janssen, Marcel A. C., 5,066,656, Cl. 514-269.000.

Janssen Pharmaceutica N.V.: *See—*
Greco, Michael N.; and Janssen, Marcel A. C., 5,066,656, Cl. 514-269.000.

Japan Aviation Electronics Industry, Ltd.: *See—*
Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, 5,065,941, Cl. 439-264.000.

Japan Electronic Control Systems Co., Ltd.: *See—*
Nakaniwa, Shinpei, 5,065,728, Cl. 123-489.000.

Japan Tobacco Inc.: *See—*
Sagawa, Takayoshi; and Tani, Shichisei, 5,065,800, Cl. 141-67.000.

Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., to Westinghouse Electric Corp. Process for making a superconducting magnet coil assembly for particle accelerators. 5,065,496, Cl. 29-599.000.

Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., to Westinghouse Electric Corp. Apparatus for making a superconducting magnet for particle accelerators. 5,065,497, Cl. 29-564.700.

Jean Walterscheid GmbH: *See—*
Flanhardt, Michael; Roth, Andreas; and Nienhaus, Clemens, 5,065,639, Cl. 74-417.000.

Jenkins, Christopher P., to Energy Resources & Logistics, Inc. Power plant and method of production of synchronous commercial electric power using diesel electric locomotives. 5,065,581, Cl. 60-668.000.

Jenkins, Thomas C.: *See—*
Boger, Bentley J.; and Jenkins, Thomas C., 5,065,943, Cl. 239-298.000.

Jennings, Howard. Method and apparatus for the automatic determination of surface area. 5,065,634, Cl. 73-865.500.

Jenq, Ching-Shi, to Silicon Storage Technology, Inc. Single transistor non-volatile electrically alterable semiconductor memory device with a re-crystallized floating gate. 5,067,108, Cl. 365-185.000.

Jensen, Billy M., to Ballard Medical Products. Aspirating catheter tube inserter. 5,065,754, Cl. 128-200.260.

Jensen, Gary S.: *See—*
Zegel, Douglas R.; Jensen, Gary S.; Hernick, Mark R.; and Daniels, Michael J., 5,065,559, Cl. 52-239.000.

Jensik, James B. Mounting bracket for an electrical connector. 5,066,246, Cl. 439-562.000.

Jeol, Ltd.: *See*—
Kaneta, Hiroshi; and Muraishi, Shuichi, 5,066,599, Cl. 437-7.000.

Jeromson, James R., Jr.: *See*—
Anderson, J. Edward C.; and Jeromson, James R., Jr., 5,065,650, Cl. 81-486.000.

Jespersen, Paul W.: *See*—
De Luca, Raymond F.; and Jespersen, Paul W., 5,065,895, Cl. 221-54.000.

Jessen, Karl M.: *See*—
McCown, Patricia M.; Conway, Timothy J.; and Jessen, Karl M., 5,067,099, Cl. 364-550.000.

Jex Courter, Barbara G.: *See*—
Adams, William J.; Jex Courter, Barbara G.; Fong, Craig S.; Murray, Robert C.; and Marshall, Paul A., 5,065,962, Cl. 244-234.000.

Jidosha Denki Kogyo K.K.: *See*—
Sekine, Shuji; Furuya, Takeo; and Sato, Katsuhiro, 5,066,878, Cl. 310-68.00C.

Jidosha Kiki Co., Ltd.: *See*—
Yanagi, Kunio; Yamakoshi, Mutsuro; and Kamiyoshihara, Akihiro, 5,066,072, Cl. 303-9.750.

Job, Robert C., to Shell Oil Company. Olefin polymerization catalyst. 5,066,737, Cl. 526-119.000.

Johannes Heidenheim GmbH: *See*—
Ernst, Alfons, 5,066,857, Cl. 250-231.150.

Johns Hopkins University, The: *See*—
Eaton, Harry A. C.; and Fisher, Robert S., 5,066,272, Cl. 600-9.000.
Lapp, Roger H., 5,065,974, Cl. 248-476.000.

Johnson, Alan S., to Red Devil, Inc. Vibratory mixers. 5,066,136, Cl. 366-209.000.

Johnson, Gary D.; and Hochfeld, Stanley, to Holtz, Leonard. Windproof umbrella. 5,065,779, Cl. 135-33.700.

Johnson & Johnson Consumer Products, Inc.: *See*—
Forbes Jones, Robin M.; Panzera, Carl; and DeLuca, Robert D., 5,066,225, Cl. 433-8.000.

Johnson, Jonathon S., to Ford Motor Company. Bit for drilling cast iron. 5,065,647, Cl. 76-108.600.

Johnson, Karle J.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.

Johnson, Mary S. Appearance modifying garments. 5,065,458, Cl. 2-69.000.

Johnson Matthey Inc.: *See*—
Akhtar, Masyood, 5,066,621, Cl. 501-41.000.

Johnson & Quin, Inc.: *See*—
Schneiderhan, Edward M., 5,067,088, Cl. 364-478.000.

Johnson, Richard E.: *See*—
Breeden, Robert L.; Johnson, Richard E.; Kabcenell, Amy R.; and Holmes, Thomas F., 5,066,949, Cl. 340-825.440.

Johnson, Stephen J.: *See*—
Hobbs, Sheila H.; and Johnson, Stephen J., 5,066,662, Cl. 514-364.000.

Johnson, Thomas H.: *See*—
Fried, Herbert E.; and Johnson, Thomas H., 5,066,829, Cl. 560-217.000.

Johnson, Wayne A.: *See*—
Wheeler, Todd; and Johnson, Wayne A., 5,066,149, Cl. 385-135.000.

Johnston, William D.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 5,066,290, Cl. 604-408.000.

Johnstone, Richard, to Kearney & Trecker Corporation. Probe for machine tool. 5,066,176, Cl. 409-133.000.

Jois, Yajnanarayana H. R.: *See*—
Gibson, Harry W.; and Jois, Yajnanarayana H. R., 5,066,773, Cl. 528-362.000.

Jolley, Michael E.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 5,066,426, Cl. 540-106.000.

Jones, Gary A., to Hammer Corporation. Leg curl exercise machine. 5,066,003, Cl. 272-134.000.

Jones, Gary A., to Hammer Corporation. Leg extension exercise machine. 5,066,004, Cl. 272-134.000.

Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased (by Restall, Janet E., executrix), to Secretary of the State for Defence in her Britannic Majesty's Government of United Kingdom, The. Rapid solidification route aluminium alloys containing lithium. 5,066,457, Cl. 420-552.000.

Jones, Lawrence D.; Frey, Paul T.; Gleason, David D.; Chee, Paula P.; and Slightom, Jerry L., to Upjohn Company, The. Gas driven microprojectile accelerator and method of use. 5,066,587, Cl. 435-172.100.

Jones, Lionel D., II: *See*—
Hoffman, Julie F.; and Jones, Lionel D., II, 5,066,336, Cl. 134-22.120.

Jones, Richard R.: *See*—
Harkrader, Ronald J.; Jones, Richard R.; and Peterson, Kenneth S., 5,066,483, Cl. 424-54.000.

Joppien, Hartmut: *See*—
Buhmann, Ulrich; Joppien, Hartmut; and Baumert, Dietrich, 5,066,675, Cl. 514-544.000.

Jorgenson, James C.: *See*—
Gaver, Joseph C., Jr.; and Jorgenson, James C., 5,066,248, Cl. 439-578.000.

Jose, Natividad: *See*—
Brieva, Hernando; Jose, Natividad; and Tietjen, Marlene, 5,066,485, Cl. 424-63.000.

Joulia, Pierre: *See*—
Point, Jacques; and Joulia, Pierre, 5,066,204, Cl. 417-413.000.

Joyce, Michael, to Joyce Molding Corp. Child-proof container and flip-top closure for dry or for liquid contents. 5,065,876, Cl. 215-206.000.

Joyce Molding Corp.: *See*—
Joyce, Michael, 5,065,876, Cl. 215-206.000.

Juday, Richard D.; and Sampsell, Jeffrey B., to United States of America, National Aeronautics and Space Administration. Programmable remapper for image processing. 5,067,019, Cl. 358-160.000.

Judkins, Brian D.: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.

Jujo Paper Co., Ltd.: *See*—
Minami, Toshiaki; Fukuchi, Tadakazu; Ohashi, Reiji; and Kaneko, Toshio, 5,066,634, Cl. 503-209.000.

Jung, Tae-Sung: *See*—
Kim, Byeong-Yun; Jung, Tae-Sung; and Park, Yong-Bo, 5,067,109, Cl. 365-189.050.

Jurgich, Donald. Label dispenser. 5,065,896, Cl. 221-73.000.

Kabcenell, Amy R.: *See*—
Breeden, Robert L.; Johnson, Richard E.; Kabcenell, Amy R.; and Holmes, Thomas F., 5,066,949, Cl. 340-825.440.

Kabelmetal Electro GmbH: *See*—
Hanisch, Ferdinand; and Schleese, Eckard, 5,066,863, Cl. 250-474.100.

Kabumoto, Tsutomu: *See*—
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Fujimoto, Shinji; and Yamaguchi, Mitsugu, 5,065,853, Cl. 192-3.290.
Sahashi, Masayoshi, 5,065,509, Cl. 29-889.210.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.
Murakami, Yoshiaki; and Nishihara, Seiji, 5,065,967, Cl. 248-161.000.

Kabushiki Kaisha Kosmek: *See*—
Yonezawa, Keitaro, 5,065,610, Cl. 72-462.000.

Kabushiki Kaisha Light Kohki Seisakusho: *See*—
Shimizu, Fumio; Nishikubo, Yasutoshi; and Naito, Tadaharu, 5,065,520, Cl. 33-241.000.

Kabushiki Kaisha Okuma Tekkosho: *See*—
Matsui, Keiji, 5,066,129, Cl. 356-356.000.
Nashiki, Masayuki, 5,066,899, Cl. 318-807.000.

Kabushiki Kaisha Shinsangyokaihatsu: *See*—
Nimura, Mitsuhiro; Nanba, Akimasa; and Yokoyama, Shoji, 5,067,082, Cl. 364-449.000.

Kabushiki Kaisha Topcon: *See*—
Sekine, Akihiko, 5,066,116, Cl. 351-221.000.

Kabushiki Kaisha Toshiba: *See*—
Asano, Masamichi; Iwahashi, Hiroshi; and Yokoyama, Sadayuki, 5,067,111, Cl. 365-189.080.
Hara, Hiroyuki; Sugimoto, Yasuhiro; and Nagamatsu, Tetsu, 5,066,996, Cl. 357-43.000.
Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, 5,066,982, Cl. 355-269.000.
Itoh, Ayao, 5,065,740, Cl. 128-24.0EL.
Koya, Kiichi, 5,066,874, Cl. 307-446.000.
Nagano, Katsumi, 5,067,042, Cl. 361-406.000.
Nagashima, Seiko; and Serizawa, Takanobu, 5,067,170, Cl. 392-461.000.
Nakane, Hiroshi, 5,067,128, Cl. 371-5.500.
Nakazawa, Masahisa, 5,067,091, Cl. 364-490.000.
Ochiai, Tamiya, 5,067,127, Cl. 370-58.100.
Sakamoto, Noriya; Yasuki, Seijiro; and Kawai, Kiyoyuki, 5,067,018, Cl. 358-142.000.
Sakurai, Kiyofumi; Fujii, Syuso; and Shimizu, Mitsuru, 5,066,997, Cl. 357-45.000.
Ueno, Masaji; and Ofusa, Kumi, 5,066,875, Cl. 307-446.000.
Yamamoto, Tadashi; Kohyama, Yusuke; and Tanaka, Takeshi, 5,066,609, Cl. 437-52.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kanazawa, Hirotaka; Fujimoto, Yoshitomi; and Suzuki, Michio, 5,065,576, Cl. 60-295.000.
Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, 5,066,201, Cl. 417-222.00R.
Ohta, Shuji; and Takeuchi, Toshiyuki, 5,065,664, Cl. 91-420.000.
Saitoh, Takeshi; and Kohno, Nozomu, 5,066,055, Cl. 292-228.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, 5,066,201, Cl. 417-222.00R.

Kabushiki Kaisha Yaskawa Denkiseisakusho: *See*—
Nishikawa, Seigo; Okumura, Shinji; Amano, Tadayuki; and Hata, Kazutoshi, 5,066,848, Cl. 219-124.340.

Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
Sasaki, Minoru, 5,065,766, Cl. 128-708.000.

Kaczorek, Joseph W.: *See*—
Hollesen, David B.; Kaczorek, Joseph W.; and Treible, Edwin S., 5,065,692, Cl. 118-302.000.

Kadis, Paul M., to Teledyne Industries, Inc. Press assembly with cushion assembly and auxiliary apparatus. 5,065,606, Cl. 72-348.000.

Kadis, Paul M.; and Hiney, Leonard L., to Teledyne Industries, Inc. Piston and cylinder assembly. 5,065,607, Cl. 72-351.000.

Kadokura, Hidekimi; and Saegusa, Kunio, to Sumitomo Chemical Company, Limited. Lamina and a cosmetic comprising the same. 5,066,530, Cl. 428-98.000.

Kadrmas, Kenneth A. Automatic disc changer apparatus. 5,067,116, Cl. 369-37.000.

Kageyama, Masaaki: *See*—
Yamagata, Kazuyoshi; Kageyama, Masaaki; and Kaneko, Kyoichi, 5,066,842, Cl. 200-345.000.

Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, to Aisin Seiki Kabushiki Kaisha Kariya; and Toyota Jidosha Kabushiki Kaisha, Toyoto. Apparatus for absorbing torque variation. 5,065,642, Cl. 74-574.000.

Kahning, Stefan: *See*—
Albarda, Scato; Thoren, Werner; Kahning, Stefan; and Vehrens, Peter, 5,065,978, Cl. 251-129.060.

Kai, Takashi: *See*—
Yoshinaga, Kazuo; Keneko, Shuzo; Kai, Takashi; Isaka, Kazuo; and Ohnishi, Toshikazu, 5,066,107, Cl. 359-45.000.

KAI Technologies: *See*—
Kasevich, Raymond S., 5,065,819, Cl. 166-248.000.

Kajima Corporation: *See*—
Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, 5,065,552, Cl. 52-1.000.
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.

Kakita, Tsuyoshi; and Yoshimura, Masazi, to Konica Corporation. Swinging type camera. 5,066,970, Cl. 354-402.000.

Kakuda, Masayuki; Sekiya, Shin; and Kitora, Yoshihisa, to Mitsubishi Denki K.K. Fluid scroll machine with torque transmitting coupling between scrolls. 5,066,206, Cl. 418-55.300.

Kalishman, Calvin. Air-moisture generation system. 5,065,753, Cl. 128-200.110.

Kalkbrenner, Ralph W.: *See*—
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,496, Cl. 29-599.000.
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,497, Cl. 29-564.700.

Kalyandurg, Satyan R., to Eastman Kodak Company. Mechanism for responsively spacing a development roller. 5,066,981, Cl. 355-245.000.

Kamarei, Ahmed R.: *See*—
Szabo, Sandor; Rubin, Meryl S. A.; Klibaner, Michael; and Kamarei, Ahmed R., 5,066,496, Cl. 424-570.000.

Kamei, Hideo: *See*—
Ohnuma, Takeshi; Hoshi, Hideaki; Kamei, Hideo; and Naito, Takayuki, 5,066,645, Cl. 514-27.000.

Kamen, Melvin E.; and Bernstein, Philip, to Revlon, Inc. Method for preparing cosmetic products and the products obtained thereby. 5,066,486, Cl. 424-63.000.

Kameyama, Isao, to Yazaki Corporation. Electric connector with a terminal locking mechanism. 5,066,253, Cl. 439-752.000.

Kamijima, Hiroshi: *See*—
Ogura, Wataru; and Kamijima, Hiroshi, 5,067,028, Cl. 358-494.000.

Kamiya, Masakazu: *See*—
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.

Kamiyama, Toshihiro: *See*—
Ito, Yasutoshi; Kamiyama, Toshihiro; and Kawashima, Fuminori, 5,065,709, Cl. 123-90.150.

Kamiyoshihara, Akihiro: *See*—
Yanagi, Kunio; Yamakoshi, Mutsuro; and Kamiyoshihara, Akihiro, 5,066,072, Cl. 303-9.750.

Kampf, Gunther: *See*—
Feldhues, Michael; Kampf, Gunther; and Mecklenburg, Thomas, 5,066,731, Cl. 525-417.000.

Kamyr, Inc.: *See*—
Meredith, Michael D., 5,066,362, Cl. 162-17.000.

Kanagawa, Takashi; Shiino, Yutaka; and Furuyama, Tetsuya, to Fuji Xerox Co., Ltd. Image forming apparatus having a print cartridge. 5,066,976, Cl. 355-200.000.

Kanai, Hiroshi: *See*—
Miyabayashi, Shigeaki; Sakamoto, Takuro; Kanai, Hiroshi; and Oka, Joji, 5,066,757, Cl. 528-45.000.

Kanakura, Akihiro: *See*—
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.

Kanaya, Yasuhiko: *See*—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 5,066,171, Cl. 408-1.00R.

Kanazawa, Hirotaka; Fujimoto, Yoshitomi; and Suzuki, Michio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Exhaust gas purifying device for a diesel engine. 5,065,576, Cl. 60-295.000.

Kanda, Shigeto, to Canon Kabushiki Kaisha. Position detecting device for use by switching plural alternating signals having different phases from each other. 5,067,118, Cl. 369-44.270.

Kanda, Yuichi: *See*—
Kishi, Hajimu; Mizuno, Tohru; and Kanda, Yuichi, 5,066,847, Cl. 219-124.340.

Kane, Edmund J.; and Koops, Roger L., to Donnelly Corporation. Panel assembly for vehicles with molded regulator attachment. 5,065,545, Cl. 49-375.000.

Kane, Robert H.: *See*—
Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, 5,066,544, Cl. 428-614.000.

Kaneda, Ichiro; Yamamoto, Seiji; and Fujii, Natsuji, to Atsugi Unisia Corporation. Integrated actuator unit for anti-skid brake control system for automotive vehicle. 5,066,075, Cl. 303-113.00R.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Nakayama, Takehisa; Hayashi, Akimine; Kondo, Masataka; Murakami, Satoru; Yamaguchi, Minori; and Tawada, Yoshihisa, 5,066,861, Cl. 250-370.090.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Noguchi, Takehiko; Sakubata, Takashi; and Nagano, Hirosaku, 5,066,770, Cl. 528-353.000.

Kaneko Agricultural Machinery Co., Ltd.: *See*—
Kaneko, Aijiro; and Domon, Masayuki, 5,065,528, Cl. 34-93.000.

Kaneko, Aijiro; and Domon, Masayuki, to Kaneko Agricultural Machinery Co., Ltd. Drying apparatus utilizing solar heat. 5,065,528, Cl. 34-93.000.

Kaneko, Ichiro, to NEC Corporation. Adjacent channel interference canceller with means for minimizing intersymbol interference. 5,067,137, Cl. 375-14.000.

Kaneko, Kyoichi: *See*—
Yamagata, Kazuyoshi; Kageyama, Masaaki; and Kaneko, Kyoichi, 5,066,842, Cl. 200-345.000.

Kaneko, Shinji, to Sony Corporation. Apparatus for recording and reproducing a video signal. 5,067,026, Cl. 358-340.000.

Kaneko, Takahide: *See*—
Fukuzawa, Shigeo; Kaneko, Takahide; and Fujimura, Masaaki, 5,066,217, Cl. 425-589.000.

Kaneko, Tetsuya: *See*—
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,066,883, Cl. 313-309.000.

Kaneko, Toshio: *See*—
Minami, Toshiaki; Fukuchi, Tadakazu; Ohashi, Reiji; and Kaneko, Toshio, 5,066,634, Cl. 503-209.000.

Kaneko, Yoshiyuki, to Canon Kabushiki Kaisha. Receiver for use in remote control system. 5,066,948, Cl. 340-825.690.

Kanemasa, Katsu: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Kaneta, Hiroshi; and Muraishi, Shuichi, to Fujitsu Limited; and Jeol, Ltd. Silicon crystal oxygen evaluation method using fourier transform infrared spectroscopy (FTIR) and semiconductor device fabrication method using the same. 5,066,599, Cl. 437-7.000.

Kanjo, Dajih: *See*—
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Dajih; and Hawryszkow, Michael G., 5,065,679, Cl. 105-3.000.

Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, to Canon Kabushiki Kaisha. Driving apparatus for an electrode matrix suitable for a liquid crystal panel. 5,066,945, Cl. 340-784.000.

Kano, Tokio; Niimura, Toshinobu; and Yonekawa, Hiroyuki, to Olympus Optical Co., Ltd. Reaction apparatus. 5,066,465, Cl. 422-58.000.

Kantner, Robert C.; Rocazella, Michael A.; Weinstein, Jerry G.; and White, Danny R., to Lanxide Technology Company, LP. Ceramic articles having in situ tailored metallic component. 5,066,618, Cl. 501-127.000.

Kantoci, Darko: *See*—
Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, 5,066,642, Cl. 514-18.000.

Kapp GmbH: *See*—
Lorenz, Manfred, 5,065,546, Cl. 51-134.50R.

Kappas, Attallah; and Drummond, George S., to Rockefeller University, The. Method for suppressing the endocrine system. 5,066,650, Cl. 514-185.000.

Kar, Hasan: *See*—
Muller, Gerhard; Kar, Hasan; Dorschel, Klaus; and Schonborn, Karl-Heinz, 5,066,292, Cl. 606-7.000.

Karita, Seiichirou: *See*—
Fukuda, Tsuguhiro; Nakagomi, Hiroshi; and Karita, Seiichirou, 5,066,964, Cl. 346-140.00R.

Kariya, Takao: *See*—
Iwata, Mikio; Kariya, Takao; and Ohtsuka, Masaru, 5,066,131, Cl. 356-401.000.

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Sakamoto, Noriya; Yasuki, Seijiro; and Kawai, Kiyoyuki, 5,067,018, Cl. 358-142.000.

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Suzuki, Noboru; Toji, Shigeo; and Kawasaki, Masahiro, 5,066,968, Cl. 354-400.000.

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Ito, Yasutoshi; Kamiyama, Toshihiro; and Kawashima, Fuminori, 5,065,709, Cl. 123-90.150.

Kawashima, Masayuki: *See*—
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Kaydon Corporation: *See*—
Heck, John A.; and Wilhelm, H. Randall, 5,066,026, Cl. 277-96.100.

Kazecki, Henry L.: *See*—
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Kearney, James F.: *See*—
Babler, Egon S.; Gottwald, Johannes F.; Gruber, Dennis W.; Kearney, James F.; Mayer, William J.; and Olsen, Alf J., 5,066,150, Cl. 400-157.300.

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Glasser, Wolfgang G.; De Oliveira, Willer; Kelley, Stephen S.; and Nieh, Li S., 5,066,790, Cl. 530-502.000.

Kelly, C. Brian: *See*—
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Kelly, Michael J.: *See*—
Hancock, Jimmy W.; Kelly, Michael J.; Latham, Wayne M.; and Stinnett, Carlton E., 5,066,452, Cl. 376-252.000.

Kelly, Neal F.: *See*—
Mailloux, Dennis R.; Smith, Harry A.; and Kelly, Neal F., 5,066,047, Cl. 283-86.000.

Kelly, Stephen L.: *See*—
Byrd, Carl E.; Kelly, Stephen L.; and Beaver, Richard N., 5,066,380, Cl. 204-290.00R.

Kelly, Thomas W.: *See*—
Martz, Jonathan T.; Kelly, Thomas W.; Dowbenko, Rostyslaw; Meier, James A.; and Palermo, Anthony C., 5,066,733, Cl. 525-455.000.

Kendrick, William G., Sr.: *See*—
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Keneko, Shuzo: *See*—
Yoshinaga, Kazuo; Keneko, Shuzo; Kai, Takashi; Isaka, Kazuo; and Ohnishi, Toshikazu, 5,066,107, Cl. 359-45.000.

Kennametal Inc.: *See*—
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Kennedy, Francis A.; Neff, John P.; and Blake, Kenneth J., to Thermalock Products, Inc. Process for making an insulated building block. 5,066,440, Cl. 264-69.000.

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Kennedy, Joseph P.; and Mishra, Munmaya K., to University of Akron, The. Living polymerization of olefins to end-functionalized polymers. 5,066,730, Cl. 525-319.000.

Kent, Lloyd C.: *See*—
Levy, Alan B.; Sifniades, Stylianos; Kent, Lloyd C.; and Frollini, Dominick, Jr., 5,066,373, Cl. 204-153.210.

Kesler, Gregory J.; and Schnell, Kenneth R., to Hubbell Incorporated. Electrical box mounting apparatus. 5,065,968, Cl. 248-205.100.

Kickinson, Martin B., Jr., executor: *See*—
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Kidnie, Kevin M.: *See*—
Elmasry, Mohamed A.; and Kidnie, Kevin M., 5,066,559, Cl. 430-111.000.

Kido, Kunio, to Tanashin Denki Co., Ltd. Tape recorder having a base plate comprised of a synthetic main plate held between and integral with two auxiliary plates made of a metal material. 5,067,034, Cl. 360-74.100.

Kiekert GmbH & Kommanditgesellschaft: *See*—
Ingenhoven, Jurgen, 5,066,054, Cl. 292-201.000.
Kielwein, Thomas: *See*—
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Kienberger, Helmut: *See*—
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Kikuta, Koozi: *See*—
Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, 5,066,344, Cl. 156-138.000.
Kilbane, Farrell M.; Coleman, Richard A.; Dunbar, Frank C.; and Gibson, Alan F., to Armco Inc. Hot dip aluminum coated chromium alloy steel. 5,066,549, Cl. 428-653.000.
Killat, Ulrich; and Kruger, Johann, to U.S. Philips Corporation. Packet switching network for a communication system. 5,067,124, Cl. 370-60.000.
Kim, Byeong-Yun; Jung, Tae-Sung; and Park, Yong-Bo, to Telecommunications Co., Ltd. Data output buffer circuit for a SRAM. 5,067,109, Cl. 365-189.050.
Kim, Dong K.; and Shemenski, Robert M., to Goodyear Tire & Rubber Company, The. Alloy steel wires suitable for tire cord applications. 5,066,455, Cl. 420-100.000.
Kim, Eun J., to Samsung Electronics Co., Ltd. Image data coding apparatus. 5,067,023, Cl. 358-261.100.
Kim, Seong-tae; Choi, Su-han; and Ko, Jae-hong, to Samsung Electronics Co., Ltd. Method of making a DRAM cell with stacked trench capacitor. 5,066,608, Cl. 437-52.000.
Kim, Seung K.: *See*—
Harrold, William J.; Sansone, Joseph A.; Bonfiglio, Joseph W.; and Kim, Seung K., 5,066,891, Cl. 315-8.000.
Kimata, Toshiya: *See*—
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Kimura, Hiroshi: *See*—
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Kimura, Isao; and Hasegawa, Kenji, to Canon Kabushiki Kaisha. Ink jet head having heat-generating resistor comprised of a complex compound. 5,066,963, Cl. 346-140.00R.
Kimura, Takashi, to Hirotaka Manufacturing Co., Ltd. Directional control valve for pneumatic cylinder. 5,065,665, Cl. 91-433.000.
Kimura, Yoshihiko: *See*—
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Kincey, Peter M., to Beecham Group, p.l.c. Catalytic hydrogenation of 2-amino-6-chloropurine. 5,066,805, Cl. 544-277.000.
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King, Byron. Collapsible multi-layer insulator for a beverage container. 5,065,879, Cl. 220-739.000.
King, Charles S. Collapsible box for tissues/papers. 5,065,936, Cl. 229-101.000.
King, Donald W.: *See*—
Suciu-Foca, Nicole; and King, Donald W., 5,066,581, Cl. 435-7.240.
King, Edward J.: *See*—
Kisor, Gregory H.; and King, Edward J., 5,067,152, Cl. 380-10.000.
King, Leonard T. Steam injection and mixing apparatus. 5,066,137, Cl. 366-336.000.
Kingston Technologies, Inc.: *See*—
Stoy, George P.; Delahanty, Francis T.; and Stoy, Vladimir A., 5,066,091, Cl. 385-98.000.
Kino, Keisuke: *See*—
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Kinoda, Yasuhide: *See*—
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Kinser, Robert W. Device for detecting metallic particles in lubricant. 5,066,071, Cl. 301-108.0TW.
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, to Sumimoto Rubber Industries, Ltd. Cutter supporting unit for tire grooving apparatus. 5,065,804, Cl. 157-13.000.
Kiribayashi, Shoji, to Sharp Kabushiki Kaisha. Method of manufacturing circuit board. 5,065,506, Cl. 29-632.000.
Kishi, Hajimu; Mizuno, Tohru; and Kanda, Yuichi, to Fanuc Ltd. Automatic welding machine path correction method. 5,066,847, Cl. 219-124.340.
Kishi, Ken-ichi: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.
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Ohta, Koziro; Kurogi, Yoshihito; and Suzuki, Yasuo, 5,065,792, Cl. 137-580.000.
Kitagawa, Osamu, to Dainippon Screen Mfg. Co., Ltd. Method of recording halftone dot image. 5,067,025, Cl. 358-298.000.
Kitajima, Masaji, to Akebono Brake Industry Co., Ltd. Jig for holding disc brake pads. 5,066,229, Cl. 432-160.000.
Kitami, Chiaki: *See*—
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Kitamori, Naoto: *See*—
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Kitamura, Masaru; Ichihashi, Hiroshi; and Suzukamo, Gohfu, to Sumitomo Chemical Company, Limited. Method for removing nitrogen-containing organic compounds from crystalline metallosilicate. 5,066,630, Cl. 502-85.000.
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Kitterman, Lawrence R.: *See*—
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Manlowe, David; and Kittle, Paul A., 5,066,428, Cl. 261-29.000.
Klafta, Jerome M. Protective sheath for cuff or single or double lumen endotracheal tube. 5,065,755, Cl. 128-200.260.
Klassen, David J.; and Anderson, Edward G., to Ford Motor Company. Fault detection and isolation in automotive wiring harness by network analysis method. 5,066,919, Cl. 324-538.000.
Kleffner, Hans W.: *See*—
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Klenk, Martin, to Robert Bosch GmbH. Learning control method for an internal combustion engine and apparatus therefor. 5,065,726, Cl. 123-480.000.
Klibaner, Michael: *See*—
Szabo, Sandor; Rubin, Meryl S. A.; Klibaner, Michael; and Kamarei, Ahmed R., 5,066,496, Cl. 424-570.000.
Klier, Juergen, to Siemens Aktiengesellschaft. Electronic ballast. 5,066,894, Cl. 315-224.000.
Klingen, Willy, to J. Wagner GmbH. Method and apparatus for preserving cavity spaces. 5,066,518, Cl. 427-236.000.
Klingshirn, James A.: *See*—
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Kloke, Harrell F. Tubular bicycle lock and method for mounting same. 5,065,603, Cl. 70-233.000.
Klotzner, Winfried: *See*—
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Kluver, Ernst P. Archery bow string prop. 5,065,730, Cl. 124-35.200.
Kneer, Franz X. Apparatus for microbiological decomposition of organic waste. 5,066,392, Cl. 210-96.100.
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Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, to Kabushiki Kaisha Kobe Seiko Sho. Diamond film thermistor. 5,066,938, Cl. 338-22.0SD.
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Nakano, Hirofumi; Hara, Mitsunobu; Mokudai, Tsuyoshi; Kawamoto, Isao; Yoshida, Mayumi; and Kobayashi, Eiji, 5,066,817, Cl. 549-384.000.

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Kobayashi, Hideki: *See*—
Hosokai, Tetsushi; Takaba, Tetsuro; Ishihara, Toshihiro; and Kobayashi, Hideki, 5,065,717, Cl. 123-339.000.

Kobayashi, Kazuhiro; Kouguthi, Hifumi; and Hara, Toshio, to Denki Kagaku Kogyo Kabushiki Kaishi. System for permeation printing a plastic body. 5,065,674, Cl. 101-44.000.

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Kobayashi, Manabu, to Yamaha Hatsudoki Kabushiki Kaisha. Transmission arrangement for vehicle having motor shaft parallel to auxiliary shaft which drives a fluid coupling through a planetary gear reduction. 5,066,266, Cl. 475-59.000.

Kobayashi, Saburo: *See*—
Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, 5,066,039, Cl. 280-741.000.

Kobayashi, Tatsuya: *See*—
Goto, Masahiro; Inoue, Takahiro; Kato, Junichi; and Kobayashi, Tatsuya, 5,066,979, Cl. 355-208.000.

Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Torque distribution control system for a four-wheel drive motor vehicle. 5,066,268, Cl. 475-249.000.

Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, to Kajima Corporation. Active seismic response control system for use in structure. 5,065,552, Cl. 52-1.000.

Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, to Kajima Corporation. Elasto-plastic damper. 5,065,555, Cl. 52-167.0DF.

Koch, Russell W.: *See*—
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., 5,066,729, Cl. 525-315.000.

Kodaira, Takanori, to Canon Kabushiki Kaisha. Camera. 5,066,971, Cl. 354-465.000.

Kodaka, Yoshiro; and Takabayashi, Kiyonobu, to Nikon Corporation. Helicoid threaded tube of synthetic resin and lens barrel comprising it. 5,066,103, Cl. 359-823.000.

Kodama, Hiroshi: *See*—
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.

Koden, Mitsuhiro: *See*—
Kuratate, Tomoaki; Koden, Mitsuhiro; and Hamada, Hiroshi, 5,066,109, Cl. 359-54.000.

Koerner, Steve J., to United States of America, Navy. Non-linear data conversion system for dynamic range digital signal processing. 5,066,952, Cl. 341-138.000.

Kohler, Burkhard; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Heat treated polyarylene sulphide containing phosphine groups. 5,066,781, Cl. 528-481.000.

Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., to Sandoz Ltd. Novel compositions and method for controlling cockroaches. 5,066,482, Cl. 424-45.000.

Kohno, Hideki: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.

Kohno, Nozomu: *See*—
Saitoh, Takeshi; and Kohno, Nozomu, 5,066,055, Cl. 292-228.000.

Kohyama, Yusuke: *See*—
Yamamoto, Tadashi; Kohyama, Yusuke; and Tanaka, Takeshi, 5,066,609, Cl. 437-52.000.

Koike, Atsushi, to Canon Kabushiki Kaisha. Film forming apparatus capable of preventing adhesion of film deposits. 5,065,698, Cl. 118-719.000.

Koike, Mitsuhiro; and Wadaka, Shusou, to Mitsubishi Denki Kabushiki Kaisha. Ultrasonic insection apparatus. 5,065,629, Cl. 73-602.000.

Koike, Noboru: *See*—
Oshio, Hirohiko; Koike, Noboru; and Ochiai, Takasi, 5,067,054, Cl. 362-61.000.

Koike, Yuzuru: *See*—
Fujimoto, Sachito; and Koike, Yuzuru, 5,065,705, Cl. 123-41.150.

Koinuma, Masahiro: *See*—
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Koinuma, Masahiro, 5,066,967, Cl. 354-149.110.

Koito Manufacturing Co., Ltd.: *See*—
Oshio, Hirohiko; Koike, Noboru; and Ochiai, Takasi, 5,067,054, Cl. 362-61.000.
Suzuki, Takanori; and Ito, Makoto, 5,067,052, Cl. 362-61.000.
Suzuki, Takanori; and Suzuki, Yoshio, 5,067,056, Cl. 362-66.000.

Kojima, Atsuyuki: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,066,666, Cl. 514-380.000.

Kojima, Kiyoaki, to Clarion Co., Ltd. Electroluminescent sheet element. 5,066,551, Cl. 428-690.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Mizuno, Toshio; Muratani, Takuro; Ito, Yasuhiko; Watanabe, Tatsuo; and Inoue, Takashi, 5,066,957, Cl. 342-352.000.

Kolb, H. Michael: *See*—
Bey, Philippe; and Kolb, H. Michael, 5,066,828, Cl. 560-171.000.

Koller, Robert D., Sr.; and Hemenway, Carl P., to Rohm and Haas Company. Novel damping compositions. 5,066,708, Cl. 524-504.000.

Kolstad, Lawrence E.; and Fumanti, Robert R. V., to L. & B. Diversified Products. Method and apparatus for launching a small boat using rope retention guided. 5,066,033, Cl. 280-414.100.

Komatsu, Hideki: *See*—
Hamada, Tatsuro; Fukuoka, Hiromi; Komatsu, Hideki; and Fujimaki, Tatsuo, 5,066,721, Cl. 525-102.000.

Komatsu, Yu; Fujiki, Yoshinori; and Sasaki, Takayoshi, to National Institute for Research in Inorganic Materials. Method for separating sodium and potassium by ion exchange. 5,066,404, Cl. 210-670.000.

Komeda, Tadao: *See*—
Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Fujita, Tsutomu, 5,066,602, Cl. 437-31.000.

Komeda, Yasuhiko, to Kyocera Corporation. Band-pass filter. 5,066,933, Cl. 333-204.000.

Komen, Joseph; and Groenendaal, Jan W., to Gist-Brocades N.V. Process for microencapsulation. 5,066,436, Cl. 264-4.300.

Komoto, Mitsuo: *See*—
Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, 5,065,941, Cl. 439-264.000.

Kondo, Kenshi, to Nihon Den-Netsu Keiki Co., Ltd. Soldering apparatus of a reflow type. 5,066,850, Cl. 219-388.000.

Kondo, Masataka: *See*—
Nakayama, Takehisa; Hayashi, Akimine; Kondo, Masataka; Murakami, Satoru; Yamaguchi, Minori; and Tawada, Yoshihisa, 5,066,861, Cl. 250-370.090.

Kondo, Noboru: *See*—
Fukao, Kaname; Hamanaka, Toshiyuki; Harada, Takashi; and Kondo, Noboru, 5,066,626, Cl. 501-128.000.

Kondo, Toshio: *See*—
Suzuki, Atsushi; and Kondo, Toshio, 5,065,718, Cl. 123-339.000.

Kondoh, Kohichi, to Bunka Shutter Co., Ltd. Panel shutter assembly. 5,065,806, Cl. 160-36.000.

Kone OY: *See*—
Lindholm, Mikko; and Vaha, Pentti, 5,067,013, Cl. 358-93.000.

Konica Corporation: *See*—
Goto, Narito; and Ando, Yasuo, 5,066,534, Cl. 428-212.000.
Kakita, Tsuyoshi; and Yoshimura, Masazi, 5,066,970, Cl. 354-402.000.
Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, 5,066,574, Cl. 430-557.000.
Nagashima, Toshiharu; and Yoshida, Kazuhiro, 5,066,569, Cl. 430-393.000.
Yoshino, Kunihisa; Motohashi, Mitsuo; and Fujii, Yozo, 5,065,693, Cl. 118-657.000.

Konig, Gert; and Baumann, Jurgen, to Martin & Pagenstecher GmbH. Refractory thixotropic vibration compound for the vibration lining of metallurgical vessels. 5,066,624, Cl. 501-107.000.

Konig, Ulf: *See*—
Kasper, Erich; Kuisl, Maximilian; Konig, Ulf; and Luy, Johann F., 5,066,605, Cl. 437-51.000.

Kono, Hiromi; and Ohtsuka, Masuhiro, to Diesel Kiki Co., Ltd. Method for correcting data used for a clutch control operation. 5,065,849, Cl. 192-0.076.

Kono, Hiromi: *See*—
Otsuka, Masuhiro; and Kono, Hiromi, 5,065,851, Cl. 192-103.00R.

Konopka, Henry E.: *See*—
Lang, Charles F.; and Konopka, Henry E., 5,066,180, Cl. 411-103.000.

Konuma, Nobuhiro: *See*—
Yoshida, Takahoko; Muranaka, Masayuki; Yoshikawa, Hiroki; Hirata, Koji; Yoshizaki, Isao; Teratani, Masakuni; and Konuma, Nobuhiro, 5,066,099, Cl. 359-457.000.

Koops, Roger L.: *See*—
Kane, Edmund J.; and Koops, Roger L., 5,065,545, Cl. 49-375.000.

Korea Institute of Science and Technology: *See*—
Yun, Kyung S.; and Cho, Byung W., 5,066,369, Cl. 204-74.000.

Koren, Yoram; and Weinstein, Yechiel, to University of Michigan, The Regents of the. Inflatable structure. 5,065,640, Cl. 74-469.000.

Kornas, Christof, to Alfred Teves GmbH. Check valve. 5,065,790, Cl. 137-514.500.

Kornbluh, Roy: *See*—
Eckerle, Joseph S.; and Kornbluh, Roy, 5,065,765, Cl. 128-672.000.

Kosako, Kosei: *See*—
Tanaka, Hitoshi; and Kosako, Kosei, 5,066,965, Cl. 354-64.000.

Koshino, Susumu: *See*—
Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Koinuma, Masahiro, 5,066,967, Cl. 354-149.110.

Kosten, Richard B.: *See*—
Krasznai, Charles Z.; and Kosten, Richard B., 5,065,473, Cl. 15-339.000.

Koster, Archie: *See*—
Reid, Laurie M.; Koster, Archie; and Hunt, Gary D., 5,065,856, Cl. 198-419.300.

Kotachi, Akiko; Takechi, Satoshi; and Nakamura, Yuko, to Fujitsu Limited. Resist material for energy beam lithography and method of using the same. 5,066,751, Cl. 526-279.000.

Kotani, Norihiko: *See*—
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,067,101, Cl. 364-578.000.

Kouguthi, Hifumi: *See*—
Kobayashi, Kazuhiro; Kouguthi, Hifumi; and Hara, Toshio, 5,065,674, Cl. 101-44.000.

Koura, Kouji: *See*—
Hino, Seiichi; Satou, Shoichi; Koura, Kouji; and Suzuki, Osamu, 5,066,771, Cl. 528-353.000.

Kowtko, Robert M.; and Mellwig, Richard A., to Binney & Smith Inc. Apparatus for injection of viscous material. 5,066,216, Cl. 425-562.000.

Koya, Kiichi, to Kabushiki Kaisha Toshiba. Signal output circuit having bipolar transistor in output stage and arranged in CMOS semiconductor integrated circuit. 5,066,874, Cl. 307-446.000.

Kozak, Mark; and Nichols, Michael, to Mill-Rose Laboratories, Inc. Rotatable surgical snare. 5,066,295, Cl. 606-47.000.

Kozo Iizuka, Director-General of Agency of Industrial Science and Technology: *See*—
Hino, Seiichi; Satou, Shoichi; Koura, Kouji; and Suzuki, Osamu, 5,066,771, Cl. 528-353.000.

Kraft, Klaus: *See*—
Wehnert, Wolfgang; Reinking, Klaus; Bier, Peter; Kraft, Klaus; and Tresper, Erhard, 5,066,704, Cl. 524-449.000.

Krakowetz, Wilhelm: *See*—
Stadler, Heinz; Heinzl, Alfred; and Krakowetz, Wilhelm, 5,065,663, Cl. 91-361.000.

Kramer, Jochen: *See*—
Dohse, Hans-Peter; and Kramer, Jochen, 5,065,476, Cl. 16-114.00R.

Kramer, Joseph O.; McMaster, Dexter H.; and Mumford, Eustace H., to Glasstech, Inc. Device for positioning hot glass sheets. 5,066,321, Cl. 65-182.200.

Krammer-Herbst, Maria. Stretch frame for a stretch bed sheet. 5,065,536, Cl. 38-102.910.

Krannitz, James J.: *See*—
Carpenter, Steven P.; Cavinee, James C.; and Krannitz, James J., 5,065,472, Cl. 15-317.000.

Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Device for controlling aerodynamic bodies. 5,065,957, Cl. 244-3.210.

Krasznai, Charles Z.; and Kosten, Richard B., to Black & Decker Inc. Filter assembly for a vacuum cleaner. 5,065,473, Cl. 15-339.000.

Krause, Norbert; Hanke, Wilhelm; and Ruhl, Juergen, to Siemens Aktiengesellschaft. Cable guide for a nuclear magnetic resonance tomography apparatus. 5,065,760, Cl. 128-653.500.

Krauss, Lothar: *See*—
Muller, Heinz-Joachim; Sluma, Heinz-Dieter; Eberhard, Gunter; Spindler, Ernst; Krauss, Lothar; and Volker, Helmut, 5,066,401, Cl. 210-500.350.

Krauss, Werner: *See*—
Belikan, Thomas; and Krauss, Werner, 5,065,742, Cl. 128-24.0EL.

Krausse, Peter, to Siemens Aktiengesellschaft. Light waveguide plug-type connector. 5,066,096, Cl. 385-58.000.

Krauter, Allan I., to Welch Allyn, Inc. Hooking cap for borescope. 5,066,122, Cl. 356-241.000.

Krauter, Immanuel; and Klotzner, Winfried, to Robert Bosch GmbH. Cylinder recognition apparatus for a distributorless ignition system. 5,065,729, Cl. 123-643.000.

Kreischer, Charles H.: *See*—
Beltran, Adrian M.; and Kreischer, Charles H., 5,066,459, Cl. 420-58.800.

Kreiseder, Walter J.: *See*—
Schuh, Robert R.; Terrell, Nancy E.; Kreiseder, Walter J.; and Vogel, Allen J., 5,065,887, Cl. 220-338.000.

Kretchman, Gerald L., to Whirlpool Corporation. Dryer transition duct. 5,066,050, Cl. 285-319.000.

Krettek, Guntram; and Schmitz, Wilhelm, to Krupp Industrietechnik GmbH. Blade-support system for centrifuge. 5,066,271, Cl. 494-58.000.

Krishnakumar, Anjur S.; Krishnamurthy, Bala; and Sabnani, Krishan K., to AT&T Bell Laboratories. Programmable protocol engine having context free and context dependent processes. 5,067,104, Cl. 395-375.000.

Krishnakumar, Suppayan M.; Collette, Wayne N.; and Nahill, Thomas E., to Continental PET Technologies, Inc. Refillable polyester container and preform for forming the same. 5,066,528, Cl. 428-36.920.

Krishnamurthy, Bala: *See*—
Krishnakumar, Anjur S.; Krishnamurthy, Bala; and Sabnani, Krishan K., 5,067,104, Cl. 395-375.000.

Krogstad, Ivar, to Pusnes A/S. Turret device. 5,065,689, Cl. 114-230.000.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Weiss, Wilhelm, 5,065,799, Cl. 141-39.000.

Kroon, David H.; Goldsmith, Gary; Baach, Miachel K.; and Bushman, James B., to Corrpro Companies Inc. Cathodic protection system and method for above-ground storage tank bottoms. 5,065,893, Cl. 220-565.000.

Kruger, Johann: *See*—
Killat, Ulrich; and Kruger, Johann, 5,067,124, Cl. 370-60.000.

Kruger, Volker; and Panzke, Rolf, to Baker Hughes Incorporated. Apparatus for optional straight or directional drilling underground formations. 5,065,826, Cl. 175-75.000.

Krupp Industrietechnik GmbH: *See*—
Krettek, Guntram; and Schmitz, Wilhelm, 5,066,271, Cl. 494-58.000.

Krupp Koppers GmbH: *See*—
Wetzel, Rolf; and Firnhaber, Bernhard, 5,066,476, Cl. 423-648.100.

Krupp Widia GmbH: *See*—
Von Haas, Rainer; and Tack, Hans, 5,065,492, Cl. 29-426.600.

Krusos, Denis A.: *See*—
Disanto, Frank J.; and Krusos, Denis A., 5,066,946, Cl. 340-787.000.

Kubo, Hiroshi: *See*—
Tanemoto, Kei; Ando, Akiro; and Kubo, Hiroshi, 5,066,617, Cl. 501-134.000.

Kubo, Kazutoshi: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.

Kubo, Yutaka; and Hara, Hisao, to Hitachi Metals, Ltd. Conductive ceramic sintered body. 5,066,423, Cl. 252-516.000.

Kubota Corporation: *See*—
Nishiyama, Shigeru; and Amano, Hide, 5,065,720, Cl. 123-363.000.

Kubota, Masayuki: *See*—
Toide, Eiichi; Shikama, Shinsuke; and Kubota, Masayuki, 5,066,138, Cl. 369-112.000.

Kubota, Takayuki. Kubotai restraint device having two batons bound together by a cord at points spaced from the ends of the batons. 5,066,013, Cl. 273-84.00R.

Kubota, Tetsumaru: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, to Konica Corporation. Silver halide photographic light-sensitive material containing a novel yellow coupler. 5,066,574, Cl. 430-557.000.

Kubota, Yoichi: *See*—
Tsukiji, Masaaki; Nishimura, Tetsuharu; Ishizuka, Koh; Ishii, Satoshi; and Kubota, Yoichi, 5,066,130, Cl. 356-356.000.

Kuchar, Franz, to U.S. Philips Corporation. System for reproducing picture signals and inserting character signals in the reproduced picture signals. 5,067,030, Cl. 360-14.100.

Kudelski SA fabrique de'enregistreurs Nagra: *See*—
Kudelski, Stefan; Schlup, Jean-Claude; and Rosselet, Ernest, 5,067,035, Cl. 360-85.000.

Kudelski, Stefan; Schlup, Jean-Claude; and Rosselet, Ernest, to Kudelski SA fabrique de'enregistreurs Nagra. Error prevention in a recording and reproducing device with at least one rotating head. 5,067,035, Cl. 360-85.000.

Kudo, Takeo: *See*—
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.

Kuehn, Melvin C. Bi-fold hay rake system. 5,065,570, Cl. 56-377.000.

Kuenast, Christoph: *See*—
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

Kugimiya, Koichi: *See*—
Nishida, Masamitsu; Ando, Hamae; and Kugimiya, Koichi, 5,065,946, Cl. 241-16.000.

Kuisl, Maximilian: *See*—
Kasper, Erich; Kuisl, Maximilian; Konig, Ulf; and Luy, Johann F., 5,066,605, Cl. 437-51.000.

Kulkarni, Gurunath H.; Naik, Rajan H.; and Rajappa, Srinivasachari, to Council of Scientific & Industrial Research. Process for the preparation of aryl esters of N-alkyl carbamic acids. 5,066,819, Cl. 549-438.000.

Kult, Roger R.; Bailey, Terry R.; and Tolliver, Howard R., to Minnesota Mining and Manufacturing Company. Cellular encapsulated-lens high whiteness retroreflective sheeting with flexible cover sheet. 5,066,098, Cl. 359-540.000.

Kumagai, Kazuo: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.

Kumagai, Noriaki: *See*—
Nohira, Hiroyuki; Onishi, Takashi; Yamamoto, Kazuo; and Kumagai, Noriaki, 5,066,826, Cl. 560-60.000.

Kumagai, Takashi: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.

Kumakura, Toshihisa; Nanaumi, Ken; Ikezawa, Ryoichi; and Eriguchi, Hideki, to Hitachi Chemical Co., Ltd. Adhesive composition for metal-clad laminates. 5,066,691, Cl. 523-438.000.

Kumobayashi, Hidenori: *See*—
Sayo, Noboru; Kumobayashi, Hidenori; Akutagawa, Susumo; Noyori, Ryoji; and Takaya, Hidemasa, 5,066,815, Cl. 549-319.000.

Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, to Mitsubishi Denki Kabushiki Kaisha. Topography simulation method. 5,067,101, Cl. 364-578.000.

Kunugi, Hitoshi: *See*—
Yoshimura, Hironori; Sawada, Yoshihiro; Nakahara, Kei; Kunugi, Hitoshi; and Sakurai, Keiichi, 5,066,553, Cl. 428-698.000.

Kunz, Walter; Schurter, Rolf; and Nyfeler, Robert, to Ciba-Geigy Corporation. Agents for protecting plants against diseases. 5,066,661, Cl. 514-361.000.

Kupfer, Adelbert: *See*—
Gall, Arthur; and Kupfer, Adelbert, 5,067,142, Cl. 378-99.000.
Kurano, Kazuyuki: *See*—
Kasai, Junichi; Yagihashi, Wataru; Yatsunami, Akira; and Kurano, Kazuyuki, 5,067,159, Cl. 381-90.000.
Kuraray Company, Ltd.: *See*—
Nohira, Hiroyuki; Onishi, Takashi; Yamamoto, Kazuo; and Kumagai, Noriaki, 5,066,826, Cl. 560-60.000.
Tsuruta, Hitoshi; Yamada, Hideaki; and Nakamura, Michihiro, 5,066,582, Cl. 435-7.100.
Kurata, Narito: *See*—
Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, 5,065,552, Cl. 52-1.000.
Kuratate, Tomoaki; Koden, Mitsuhiro; and Hamada, Hiroshi, to Sharp Kabushiki Kaisha. Half-tone liquid crystal display device. 5,066,109, Cl. 359-54.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, 5,066,384, Cl. 208-45.000.
Seo, Ikuo; Oono, Tooru; and Murakami, Yosinobu, 5,066,779, Cl. 528-396.000.
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Ice thermal storage apparatus. 5,065,598, Cl. 62-330.000.
Kurland, Jeffrey. Suction cup projectile for use in paddle game. 5,066,017, Cl. 273-344.000.
Kuroda, Shigeo: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.
Kurogi, Yoshihito: *See*—
Ohta, Koziro; Kurogi, Yoshihito; and Suzuki, Yasuo, 5,065,792, Cl. 137-580.000.
Kurokawa, Toshio: *See*—
Nakamura, Takashi; and Kurokawa, Toshio, 5,066,570, Cl. 430-421.000.
Kurosawa, Masaaki: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.
Kuwabara, Satoru, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus using an elongated web-like recording medium. 5,066,973, Cl. 355-27.000.
Kuwahara, Tetsuya: *See*—
Satomi, Mitsuo; Oshita, Kazuaki; and Kuwahara, Tetsuya, 5,067,150, Cl. 379-354.000.
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, to Brother Kogyo Kabushiki Kaisha. Recording apparatus with mechanism for cutting printed tape covered by backing tape. 5,066,152, Cl. 400-621.000.
Kweon, Jung M., to Sam Il Pharmaceutical Manufacturing Co., Ltd. Cancer screening method utilizing a modified millon's reagent. 5,066,601, Cl. 436-64.000.
Kwiatkowski, Richard F. Calibratable non-contact inductive distance measuring device. 5,066,912, Cl. 324-224.000.
Kwong, Peter C.: *See*—
Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., 5,066,290, Cl. 604-408.000.
Kyocera Corporation: *See*—
Komeda, Yasuhiko, 5,066,933, Cl. 333-204.000.
Kyosuke, Kitoh: *See*—
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Lukey, Christopher A.; Maitra, Ashit M.; and Tyler, Ralph J., 5,066,629, Cl. 502-84.000.

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Chlebina, Larry E.; Majerus, Norbert; Rambacher, John S.; and Felder, Stephen L., 5,066,448, Cl. 264-334.000.

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Giacobbe, Francesco, 5,066,421, Cl. 252-373.000.
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Mark, Edward H., to Packard Industries, Inc. Multiple section work station. 5,065,832, Cl. 108-60.000.
Markes, Robby M. Circle cutter. 5,065,517, Cl. 30-300.000.
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Marks, Dennis R.: *See—*
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Martin, Douglas R., to Olin Corporation. Process for producing moldable detergents having a stable available chlorine concentration. 5,066,416, Cl. 252-90.000.
Martin, Guenter, to Siemens Aktiengesellschaft. Method for generating a random number for the encoded transmission of data upon employment of a variable starting value. 5,067,156, Cl. 380-46.000.
Martin, Kenneth A.: *See—*
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Martin, Norman D., to Nuckolls, Thomas B.; and Daubenbis, Stanley D., part interest to each. Window assembly. 5,065,544, Cl. 49-177.000.
Martin & Pagenstecher GmbH: *See—*
Konig, Gert; and Baumann, Jurgen, 5,066,624, Cl. 501-107.000.
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Martinez, Robert J.; and Rye, Robert R., to United States of America, Energy. Selective protection of poly(tetra-fluoroethylene) from effects of chemical etching. 5,066,565, Cl. 430-296.000.
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Masuda, Yoshitomo: *See—*
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Matsui, Keiji, to Kabushiki Kaisha Okuma Tekkosho. Optical linear encoder with light quantity calabration. 5,066,129, Cl. 356-356.000.
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Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

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Matsuoka, Toshio; Higashida, Akio; and Satake, Tokuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Ground-surface-effect wing plane. 5,065,833, Cl. 180-117.000.

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— Nakamura, Yasuhiro; Sakai, Ikuo; and Kawabuchi, Masami, 5,065,764, Cl. 128-661.090.

— Nishida, Masamitsu; Ando, Hamae; and Kugimiya, Koichi, 5,065,946, Cl. 241-16.000.

— Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Fujita, Tsutomu, 5,066,602, Cl. 437-31.000.

— Yamamoto, Hajime, 5,066,989, Cl. 355-270.000.

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— Yoshida, Yoshikazu; Tanaka, Kunio; and Nishikawa, Yukio, 5,065,697, Cl. 118-719.000.

— Yoshinaka, Minoru; Asakura, Eizo; Misaki, Toshihiro; Kitano, Motoi; and Yoshida, Hideyuki, 5,066,475, Cl. 423-622.000.

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Matthews, Abraham, to Du Pont de Nemours, E. I., and Company. Process for centrifugally spinning pitch carbon fibers. 5,066,430, Cl. 264-8.000.

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Matzner, Markus; and Layton, Richard, to Amoco Corporation. Wholly aromatic polyesters comprising isophthalic acid, terephthalic acid, p-hydroxybenzoic acid, hydroquinone and an arylene diol. 5,066,767, Cl. 528-193.000.

Maurer, Albert: *See*— Gabathuler, Jean-Pierre; Eckert, Karl-Ludwig; Kaser, Peter; Maurer, Albert; and Fischer, Anton, 5,066,432, Cl. 264-28.000.

Maurer, Maurice M.: *See*— Alletto, John S.; and Maurer, Maurice M., 5,065,798, Cl. 140-123.600.

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Maxwell, Robert L. Manipulative skill testing apparatus. 5,065,750, Cl. 128-745.000.

Maya, Jakob: *See*— Bouchard, Andre C.; Lagushenko, Radomir; and Maya, Jakob, 5,066,892, Cl. 315-46.000.

Mayer, William J.: *See*— Babler, Egon S.; Gottwald, Johannes F.; Gruber, Dennis W.; Kearney, James F.; Mayer, William J.; and Olsen, Alf J., 5,066,150, Cl. 400-157.300.

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Mazda Motor Corporation: *See*— Hosokai, Tetsushi; Takaba, Tetsuro; Ishihara, Toshihiro; and Kobayashi, Hideki, 5,065,717, Cl. 123-339.000.

McCaffrey, Joseph T.; and McKay, Stewart P. Personal protection device. 5,065,904, Cl. 222-3.000.

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McCloskey, John E.: *See*— Cooke, Kevin K.; Dewitt, John R.; and McCloskey, John E., 5,067,041, Cl. 361-394.000.

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McCormick, Sharon J.: *See*— Sivavec, Timothy M.; and McCormick, Sharon J., 5,066,719, Cl. 525-92.000.

McCown, Patricia M.; Conway, Timothy J.; and Jessen, Karl M., to Allied-Signal Inc. Methods and apparatus for monitoring system performance. 5,067,099, Cl. 364-550.000.

McDonald, Mark E., to Hughes Aircraft Company. High throughput contrast enhancement for polarized displays. 5,066,108, Cl. 359-65.000.

McDonnell Douglas Corporation: *See*— Ferrante, Ronald A., 5,066,100, Cl. 359-569.000.

McDonner, Orville R., to Fuqua Industries, Inc. Bearing assembly for lawn mower cutting blade. 5,066,146, Cl. 384-473.000.

McDonough, Charles M., to PCF Group, Inc. Filter element gasket. 5,066,318, Cl. 55-502.000.

McElroy, James B.: *See*— Marshall, Donald E.; and McElroy, James B., 5,067,004, Cl. 357-71.000.

McFalls, David S., II: *See*— Wenzel, Dennis J.; and McFalls, David S., II, 5,067,085, Cl. 364-474.060.

McFarland, Thomas G.: *See*— Vavrek, Robert M.; and McFarland, Thomas G., 5,066,914, Cl. 324-309.000.

McGee, Philip J. L., to U.S. Philips Corporation. Method of determining the monitor sensitivity of, and method and system for controlling a radiation emitting arrangement, and optical recording and/or reproducing apparatus including such a system. 5,067,122, Cl. 369-116.000.

McGee, Susan: *See*— Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, 5,066,544, Cl. 428-614.000.

McGraw, Thomas C.; Van Ryne, Randall E.; Scarlata, Richard F.; and Sze, Cho Y., to Xerox Corporastion. Disk stacker including movable gate for insertion of sheets into disk slots. 5,065,996, Cl. 271-176.000.

McHugh, Kevin: *See*— Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.

McKay, Stewart P.: *See*— McCaffrey, Joseph T.; and McKay, Stewart P., 5,065,904, Cl. 222-3.000.

McKee, Michael J.: *See*— Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., 5,065,501, Cl. 29-611.000.

McKeen, Francis X.: *See*— Fite, Elaine H.; Fossum, Tryggve; Grundmann, William R.; McKeen, Francis X.; and Salett, Ronald M., 5,067,069, Cl. 395-375.000.

McKenzie, Archibald M. Multiple bit power drill. 5,065,498, Cl. 29-568.000.

McLean, John A. B., to Bea-Bar Enterprises Ltd. Apparatus for mounting an antenna for rotation on a mast. 5,065,969, Cl. 248-282.000.

McManigal, Paul G.; and Vaughan, Philip A. Accurate high-flow clean regulator with input-pressure balancing. 5,065,788, Cl. 137-505.180.

McMaster, Dexter H.: *See*— Kramer, Joseph O.; McMaster, Dexter H.; and Mumford, Eustace H., 5,066,321, Cl. 65-182.200.

McNab, John G., to Graves Spray Supply, Inc. Pneumatic material dispensing monitor. 5,065,902, Cl. 222-31.000.

McNamara, Timothy J.: *See*— Evans, Timothy G.; Gould, Mark W.; and McNamara, Timothy J., 5,067,129, Cl. 371-16.100.

Meakin, Peter J.: *See*— Cogswell, Frederic N.; and Meakin, Peter J., 5,066,536, Cl. 428-216.000.

Mears, Dana C.: *See*— Chapman, Michael W.; Mears, Dana C.; and Edwards, Charles C., 5,066,296, Cl. 606-64.000.

Measells, Paul E.; Johnston, William D.; Kwong, Peter C.; Laurin, Dean G.; and Czuba, Leonard F., to Baxter International Inc. Sterilizable multi-layer plastic materials for medical containers and the like. 5,066,290, Cl. 604-408.000.

Measurex Corporation: *See*— Taylor, Bruce S.; and Balakrishnan, Ramesh, 5,065,673, Cl. 100-40.000. Wennerberg, Gunnar, 5,066,865, Cl. 250-572.000.

Mecaplastic: *See*— Robache, Patrick, 5,065,563, Cl. 53-69.000.

Mecklenburg, Thomas: *See*— Feldhues, Michael; Kampf, Gunther; and Mecklenburg, Thomas, 5,066,731, Cl. 525-417.000.

Medical Engineering Corporation: *See*— Bark, Jeffrey E.; Hillegass, Donald V.; and Woodruff, Eric J., 5,066,303, Cl. 623-8.000.

Mediolanum Farmaceutici Srl.: *See*— Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 5,066,802, Cl. 544-32.000.

Meek, Robert A.; and Linville, Andrew F., Jr., to Mobil Oil Corporation. Method for removing coherent noise from seismic data through f-x filtering. 5,067,112, Cl. 367-43.000.

Mehu, Jacques: *See*— Huerre, Dominique; and Mehu, Jacques, 5,067,022, Cl. 358-248.000.

Meichsner, Roland: *See*— Schmickl, Werner; and Meichsner, Roland, 5,066,329, Cl. 106-20.000.

Meier, James A.: *See*— Martz, Jonathan T.; Kelly, Thomas W.; Dowbenko, Rostyslaw; Meier, James A.; and Palermo, Anthony C., 5,066,733, Cl. 525-455.000.

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Sato, Yasuo; Kato, Shinsuke; Taniguchi, Takako; Atsumi, Kunio; Hachisu, Mitsugu; and Shibahara, Seiji, 5,066,677, Cl. 514-563.000.

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Meinz, Hans W. Fluid delivery system for controlling fluid flow. 5,065,903, Cl. 222-71.000.

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Kowtko, Robert M.; and Mellwig, Richard A., 5,066,216, Cl. 425-562.000.

Mendes, Jose A. C.: *See—*
Lorento, Gustavo F.; Mendes, Jose A. C.; and Cullen, Joao A. D., 5,065,508, Cl. 29-888.042.

Mendola, Edward G.: *See—*
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,496, Cl. 29-599.000.
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,497, Cl. 29-564.700.

Meneghini, Giovanni, to DeNora Permelec S.p.A. Electrolyzer. 5,066,378, Cl. 204-237.000.

Mengeu, Gary L., to Continental Plastics, Inc. Dispensing fitment and container therefore. 5,065,908, Cl. 222-480.000.

Merboth, John A.: *See—*
Creighton, Dean W.; Efstathiou, John D.; and Merboth, John A., 5,066,506, Cl. 426-450.000.

Mercat, Jean-Pierre, to Look, S.A. Apparatus for the measurement of drive torques. 5,065,633, Cl. 73-862.340.

Mercedes-Benz AG: *See—*
Panten, Detlef; Hertweck, Gernot; and Bender, Franz, 5,065,719, Cl. 123-339.000.
Troster, Harry, 5,066,076, Cl. 303-113.000.

Merchant, Abid N., to Du Pont de Nemours, E. I., and Company. Binary zeotropic compositions of 2,2-dichloro-1,2-difluoroethane with methanol, ethanol, or trans-1,2-dichloroethylene. 5,066,417, Cl. 252-171.000.

Merchant, Abid N., to Du Pont de Nemours, E. I., and Company. Binary azeotropic compositions of 3-chloro-1,1,1-trifluoropropane with methanol or ethanol, or trans-1,2-dichloroethylene. 5,066,418, Cl. 252-172.000.

Merck & Co., Inc.: *See—*
Alexander, Jose; and Higuchi, Takeru, deceased, 5,066,648, Cl. 514-174.000.
Chen, Shieh-Shung T.; and Doss, George, 5,066,586, Cl. 435-119.000.

Meredith, Michael D., to Kamyr, Inc. Extended delignification in pressure diffusers. 5,066,362, Cl. 162-17.000.

Mereness, W. Michael: *See—*
Schulze, Dale R.; Sherman, Jon A.; and Mereness, W. Michael, 5,065,929, Cl. 227-19.000.

Merianos, John J.; Login, Robert B.; and Garelick, Paul, to ISP Investments Inc. Semi-anhydrous, suspension process for preparing uniform, free-flowing, fine, white powders of substantially anhydrous complexes of PVP and H_2O_2 containing about 18 to about 22% H_2O_2. 5,066,488, Cl. 424-80.000.

Merkel, Stephen L.: *See—*
Baron, Carl N.; Merkel, Stephen L.; and Hall, Robert C., 5,065,695, Cl. 118-688.000.

Merlin Gerin: *See—*
Suptitz, Eric, 5,066,920, Cl. 324-544.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Anzeveno, Peter B.; Angell, Paul T.; and Creemer, Laura J., 5,066,807, Cl. 546-183.000.
Bey, Philippe; and Kolb, H. Michael, 5,066,828, Cl. 560-171.000.

Merrem, Hans-Joachim; Buhr, Gerhard; and Lenz, Ruediger, to Hoechst Aktiengesellschaft. Image reversal process utilizing a positive-working photosensitive composition containing a dye. 5,066,567, Cl. 430-325.000.

Mersch, Steve H.; Spielvogel, David E.; and Daugherty, Charles W., to Becton, Dickinson and Company. Vent for flashback plug. 5,066,284, Cl. 604-168.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Fischer, Florian; and Ritzer, Christian, 5,066,267, Cl. 475-168.000.
Kranz, Walter, 5,065,957, Cl. 244-3.210.
Zinner, Helmut, 5,066,860, Cl. 250-349.000.

Metal Fusion, Inc.: *See—*
Bourgeois, Norman R.; and Robichaux, Bradley A., 5,065,735, Cl. 126-40.000.

Metal Leve S.A. Industria E Comercio: *See—*
Lorento, Gustavo F.; Mendes, Jose A. C.; and Cullen, Joao A. D., 5,065,508, Cl. 29-888.042.

Metanetix, Inc.: *See—*
DeVoe, Irving W.; D'Sylva, Olwyn A.; and Fine, David A., 5,066,371, Cl. 204-149.000.

Metsik, Viktor M.: *See—*
Zlobin, Mikhail N.; Metsik, Viktor M.; Nemarov, Alexandr A.; Permyakov, Georgy P.; and Taraban, Nikolai T., 5,066,389, Cl. 209-170.000.

Metzeler GmbH: *See—*
Michel, Werner, 5,066,780, Cl. 528-481.000.

Meyer, Richard C.; and Barber, Duane G., to Beckman Instruments, Inc. Rotatable vortexing turntable. 5,066,135, Cl. 366-208.000.

Meyer, Rolf-Volker: *See—*
Kohler, Burkhard; and Meyer, Rolf-Volker, 5,066,781, Cl. 528-481.000.

Meyer, Urs; Oberhansli, Rene F.; and Hausler, Dominik, to Rieter Machine Works Ltd. Method of and apparatus for guiding a self-steering vehicle along an optical guideway. 5,066,854, Cl. 250-202.000.

Meyers, John A.; Drake, David E.; and Witt, Charles W., to Smith International, Inc. Hammer bit retention tool. 5,065,827, Cl. 175-414.000.

Meyers, Roy D. Solar powered navigation buoy generator. 5,066,338, Cl. 136-244.000.

Michael, William R.: *See—*
Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., 5,066,419, Cl. 252-174.110.

Michalewski, David; and Roberts, Bradley M., to Gemcor Engineering Corporation. Apparatus for orienting and injecting fasteners. 5,065,898, Cl. 221-171.000.

Michalski, Dennis H., to IMC Fertilizer, Inc. Lowering post-precipitation in merchant acid. 5,066,471, Cl. 423-319.000.

Michaud, Jacques: *See—*
Cohen, Eric A.; Gaudreau, Pierrette; Michaud, Jacques; Brazeau, Paul; and Langelier, Yves, 5,066,783, Cl. 530-328.000.

Michel, Werner, to Metzeler GmbH. Method of vulcanizing rubber with heat transfer liquid. 5,066,780, Cl. 528-481.000.

Michii, Kazunari; and Takehara, Masataka, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 5,067,005, Cl. 357-72.000.

Microelectronics and Computer Technology Corporation: *See—*
Olla, Michael A., 5,065,504, Cl. 29-827.000.

Microlife Technics, Inc.: *See—*
Vedamuthu, Ebenezer R., 5,066,588, Cl. 435-172.300.

Micron Technology, Inc.: *See—*
Casper, Stephen L., 5,066,999, Cl. 357-51.000.
Lee, Ruojia, 5,066,606, Cl. 437-52.000.
Yu, Chang, 5,066,611, Cl. 437-173.000.

Micronel AG: *See—*
Meier, Peter, 5,065,745, Cl. 128-205.120.

Midland Brake, Inc.: *See—*
Gross, Dario; and Sweet, Roger L., 5,066,317, Cl. 55-218.000.

Midwest Plastic Fabricators: *See—*
Moran, Thomas F., Jr., 5,066,212, Cl. 425-145.000.

Miehle, Ernest C. Apparatus and method for cleaning a gas range burner. 5,065,737, Cl. 126-214.00R.

Migdal, Cyril A.; Shirodkar, Shailaja M.; DeRosa, Thomas F.; and Miller, Edward F., to Texaco Inc. Friction modifier additive and lubricating oil composition containing same. 5,066,412, Cl. 252-54.600.

Mihayashi, Keiji: *See—*
Ichijima, Seiji; Saito, Naoki; Mihayashi, Keiji; Ishii, Yoshio; and Ogawa, Akira, 5,066,576, Cl. 430-558.000.

Mikami, Kazuo; Ishihara, Hideshi; Nishimura, Masahiro; Tsukiyama, Noriyuki; and Hinoda, Seisuke, to Omron Tateisi Electronics Co. Image recognition device. 5,067,161, Cl. 382-1.000.

Milaire, Daniel P. F. Photographic studio light reflecting apparatus. 5,067,049, Cl. 362-18.000.

Milani, Federico: *See—*
Braga, Vittorio; Manica, Michele; Martini, Emilio; and Milani, Federico, 5,066,700, Cl. 524-380.000.

Milbar Corporation: *See—*
Anderson, J. Edward C.; and Jeromson, James R., Jr., 5,065,650, Cl. 81-486.000.

Milburn, Charles A.: *See—*
Evers, David E.; and Milburn, Charles A., 5,065,649, Cl. 81-458.000.

Mile High Equipment Company: *See—*
Alvarez, Robert J.; Martineau, Tom N.; and VanderBurgh, Steven D., 5,065,817, Cl. 165-153.000.

Mill-Rose Laboratories, Inc.: *See—*
Kozak, Mark; and Nichols, Michael, 5,066,295, Cl. 606-47.000.

Miller, Bearge D.: *See—*
Miller, Norman K.; and Miller, Bearge D., 5,066,835, Cl. 200-61.430.

Miller, Chad G., to City of Hope. Carboxyl terminal peptide and protein sequencing. 5,066,785, Cl. 530-345.000.

Miller, Charles N.: *See—*
Speiser, Robert D.; Bernstein, Steven; Miller, Charles N.; and Shearer, Dane, 5,065,549, Cl. 51-288.000.

Miller, Daniel C.: *See—*
Padera, Robert F.; and Miller, Daniel C., 5,066,393, Cl. 210-136.000.

Miller, Douglas C., to Plasta Fiber Industries, Inc. Sunvisor including a method and attachment mechanism for securing a covering to the sunvisor. 5,066,061, Cl. 296-97.100.

Miller Edge, Inc.: *See—*
Miller, Norman K.; and Miller, Bearge D., 5,066,835, Cl. 200-61.430.

Miller, Edward E.; and Strydom, Peter J., to American Cyanamid Company. Crosslinking water soluble polymers with iron to form gels for use in subterranean profile modification. 5,065,822, Cl. 166-295.000.

Miller, Edward F.: *See—*
Migdal, Cyril A.; Shirodkar, Shailaja M.; DeRosa, Thomas F.; and Miller, Edward F., 5,066,412, Cl. 252-54.600.

Miller, Jack E., to International Clamp Company. Clamp with pipe branch. 5,066,053, Cl. 285-373.000.

Miller, Jeffrey T.; and Shum, Victor K., to Amoco Corporation. Catalyst and process for high selectivity reforming with PT/RE on BA-K-L zeolite. 5,066,628, Cl. 502-66.000.

Miller, Norman K.; and Miller, Bearge D., to Miller Edge, Inc. Sensing edge. 5,066,835, Cl. 200-61.430.

Miller, Ronald E.; and James, Robert L., to Delat Systems, Incorporated. Multi-way switch system having plural remote touch pads. 5,066,898, Cl. 315-362.000.
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., to Environmental Water Technology, Inc. Fluid purifying apparatus and method of purifying fluids. 5,065,791, Cl. 137-515.000.
Milliken Research Corporation: *See*—
Christie, Wesley D., 5,066,535, Cl. 428-196.000.
Mills, James L.: *See*—
Weinberger, Scot R.; and Mills, James L., 5,066,382, Cl. 204-299.00R.
Mills, William C., Jr.: *See*—
Center, John L.; Mills, William C., Jr.; and Plaskett, John R., 5,066,269, Cl. 493-183.000.
Minakata, Rumi: *See*—
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.
Minami, Kouji: *See*—
Iwamoto, Masayuki; Minami, Kouji; and Yamaoki, Toshihiko, 5,066,340, Cl. 136-258.000.
Minami, Toshiaki; Fukuchi, Tadakazu; Ohashi, Reiji; and Kaneko, Toshio, to Jujo Paper Co., Ltd. Heat-sensitive recording sheet. 5,066,634, Cl. 503-209.000.
Minefuji, Nobutaka; and Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shading board for copying apparatus. 5,066,987, Cl. 355-233.000.
Miner Enterprises, Inc.: *See*—
Fong, Ding-Huei R.; and Carlstedt, Richard A., 5,065,874, Cl. 213-31.000.
Minnesota Mining and Manufacturing Company: *See*—
Buerli, Richard, 5,066,118, Cl. 356-73.100.
Elmasry, Mohamed A.; and Kidnie, Kevin M., 5,066,559, Cl. 430-111.000.
Huber, Charles D.; and Barry, Donald J., 5,066,529, Cl. 428-40.000.
Kult, Roger R.; Bailey, Terry R.; and Tolliver, Howard R., 5,066,098, Cl. 359-540.000.
Oxman, Joel D.; and Ubel, F. Andrew, III, 5,066,231, Cl. 433-214.000.
Polski, Stephen P., 5,066,289, Cl. 604-389.000.
Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., 5,066,419, Cl. 252-174.110.
Minolta Camera Kabushiki Kaisha: *See*—
Emori, Kiyoshi; and Maekawa, Hiroshi, 5,066,986, Cl. 355-326.000.
Misaki, Toshihiro: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Misaki, Toshihiro; Kitano, Motoi; and Yoshida, Hideyuki, 5,066,475, Cl. 423-622.000.
Misawa Homes Institute of Research & Development: *See*—
Hasebe, Noboru; and Ito, Shoji, 5,065,749, Cl. 128-664.000.
Mishra, Munmaya K.: *See*—
Kennedy, Joseph P.; and Mishra, Munmaya K., 5,066,730, Cl. 525-319.000.
Mishra, Saroj K.: *See*—
Putnam, Alan R.; Mishra, Saroj K.; and Nair, Muraleedharan G., 5,066,585, Cl. 424-121.000.
Misu, Naoaki: *See*—
Hayashi, Shunji; Yamanaka, Satoshi; Kawaguchi, Sayoko; Ishii, Teruhiko; Kimata, Toshiya; and Misu, Naoaki, 5,066,657, Cl. 514-269.000.
Mita Industrial Co., Ltd.: *See*—
Yoshizuka, Ken, 5,066,977, Cl. 355-201.000.
Mitamura, Shoji: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.
Mitchell, George; and Pelosi, Michael H., III, to Centercore, Inc. Air circulation system. 5,065,668, Cl. 98-31.500.
Mitchell, Wayne A.: *See*—
Hsieh, Shane; and Mitchell, Wayne A., 5,066,568, Cl. 430-325.000.
Mitchell, William L.: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.
Mitsuba Electric Mfg. Co., Ltd.: *See*—
Takahara, Katsuo; Okajima, Shigeru; and Onodera, Tugio, 5,065,605, Cl. 72-340.000.
Mitsubishi Denki K.K.: *See*—
Kakuda, Masayuki; Sekiya, Shin; and Kitora, Yoshihisa, 5,066,206, Cl. 418-55.300.
Wada, Shunichi, 5,067,115, Cl. 367-99.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Eimori, Takahisa; Satoh, Shinichi; Wakamiya, Wataru; Ozaki, Hiroji; and Tanaka, Yoshinori, 5,067,000, Cl. 357-53.000.
Ida, Shizuo, 5,067,032, Cl. 360-46.000.
Kawano, Minori, 5,067,171, Cl. 455-33.000.
Koike, Mitsuhiro; and Wadaka, Shusou, 5,065,629, Cl. 73-602.000.
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,067,101, Cl. 364-578.000.
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, 5,065,598, Cl. 62-330.000.
Michii, Kazunari; and Takehara, Masataka, 5,067,005, Cl. 357-72.000.
Ochi, Naoki, 5,066,903, Cl. 324-96.000.
Sakamoto, Hirokazu; Ohtani, Makoto; Nakagawa, Naoki; Maejima, Taro; and Hayama, Masahiro, 5,066,106, Cl. 359-59.000.
Toide, Eiichi; Shikama, Shinsuke; and Kubota, Masayuki, 5,066,138, Cl. 369-112.000.
Yamasaki, Tatsuo; and Fujii, Toshifumi, 5,067,031, Cl. 360-22.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Matsuoka, Toshio; Higashida, Akio; and Satake, Tokuki, 5,065,833, Cl. 180-117.000.
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.
Taura, Yoshiharu; Yuzaki, Yoshinori; and Takagi, Koichi, 5,066,184, Cl. 413-4.000.
Mitsubishi Materials Corporation: *See*—
Ohsawa, Yuzoh, 5,066,515, Cl. 427-53.100.
Mitsubishi Metal Corporation: *See*—
Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, 5,066,381, Cl. 204-298.120.
Yoshimura, Hironori; Sawada, Yoshihiro; Nakahara, Kei; Kunugi, Hitoshi; and Sakurai, Keiichi, 5,066,553, Cl. 428-698.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Hiraoka, Saburo; and Niikawa, Kenji, 5,066,768, Cl. 528-230.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Sato, Takashi; Iwanabe, Yoji; Arato, Koji; Sakagami, Rokuro; and Yoneda, Yasuo, 5,065,809, Cl. 164-61.000.
Mitsui Toatsu Chemicals Incorporated: *See*—
Aizawa, Hironori; Shin, Masaaki; and Okubo, Atsuo, 5,066,727, Cl. 525-296.000.
Miura, Hiroshi: *See*—
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, 5,066,539, Cl. 428-328.000.
Miura, Takao; and Imaoka, Kazunori, to Fujitsu Limited. Semiconductor device having semiconductor-on-insulator structure. 5,066,993, Cl. 357-23.700.
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, to Waseda University; and Mitsubishi Jukogyo Kabushiki Kaisha. Method for removing roots from cormatose plant bodies. 5,066,507, Cl. 426-481.000.
Miyabayashi, Shigeaki; Sakamoto, Takuro; Kanai, Hiroshi; and Oka, Joji, to Takeda Chemical Industries, Ltd. One-can heat-curable resin compositions and precoated metal. 5,066,757, Cl. 528-45.000.
Miyagaki, Shinji: *See*—
Ohba, Takayuki; Miyagaki, Shinji; Hara, Tatsushi; Morishita, Kenji; Suzuki, Seiichi; and Ri, Seigen, 5,066,612, Cl. 437-192.000.
Miyake, Nobuyuki, to Canon Kabushiki Kaisha. Electrophotographic apparatus having means for avoiding blurring effects caused by idle intervals. 5,066,988, Cl. 355-245.000.
Miyamoto, Keiji: *See*—
Yanaka, Yoshimi; and Miyamoto, Keiji, 5,067,008, Cl. 357-81.000.
Miyamoto, Mitunobo: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.
Miyamoto, Seiji: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.
Miyao, Kouji; and Asano, Hajime, to Sharp Kabushiki Kaisha. Word processor with operator inputted character string substitution. 5,067,070, Cl. 395-146.000.
Miyao, Masanobu; Nakagawa, Kiyokazu; Ohyu, Kiyonori; Murakami, Eiichi; and Ohshima, Takashi, to Agency of Industrial Science and Technology. Method of producing hetero structure. 5,066,355, Cl. 156-612.000.
Miyata, Koichi: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.
Miyazaki, Makoto; and Hiyoshi, Tatsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing an ion exchange membrane. 5,066,682, Cl. 521-27.000.
Miyazaki, Takahiro: *See*—
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, 5,066,539, Cl. 428-328.000.
Miyazaki, Teruko, to Ciba-Geigy Corporation. Curable polyurethane casting systems and amine hardeners therefor. 5,066,761, Cl. 528-64.000.
Miyazawa, Kenichi: *See*—
Mizoguchi, Toshiaki; and Miyazawa, Kenichi, 5,065,812, Cl. 164-480.000.
Mizoguchi, Takatoshi: *See*—
Deguchi, Katsuyasu; Mizoguchi, Takatoshi; Taminaga, Takayuki; and Fujii, Akiyoshi, 5,066,960, Cl. 346-76.0PH.
Mizoguchi, Toshiaki; and Miyazawa, Kenichi, to Nippon Steel Corporation. Process for the twin-roll type, continuous casting of metal sheets. 5,065,812, Cl. 164-480.000.
Mizukawa, Yuki: *See*—
Sato, Tadahisa; Takahashi, Osamu; Naruse, Hideaki; and Mizukawa, Yuki, 5,066,575, Cl. 430-558.000.

Mizukura, Noboru: *See*—
Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, 5,066,574, Cl. 430-557.000.

Mizuno, Tohru: *See*—
Kishi, Hajimu; Mizuno, Tohru; and Kanda, Yuichi, 5,066,847, Cl. 219-124.340.

Mizuno, Toshio; Muratani, Takuro; Ito, Yasuhiko; Watanabe, Tatsuo; and Inoue, Takashi, to Kokusai Denshin Denwa Co., Ltd. Hybrid modulation satellite communication system. 5,066,957, Cl. 342-352.000.

Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, to Sharp Kabushiki Kaisha. Liquid crystal display apparatus. 5,066,110, Cl. 359-54.000.

Mizutome, Atsushi: *See*—
Kanno, Hideo; Inoue, Hiroshi; and Mizutome, Atsushi, 5,066,945, Cl. 340-784.000.

Mobay Corporation: *See*—
Mafoti, Robson; and Sanders, Josef, 5,066,824, Cl. 560-44.000.

Mobil Oil Corporation: *See*—
Hon, Clarence C., 5,065,844, Cl. 187-17.000.
Liu, Leland L.; and Cyr, Patricia A., 5,066,434, Cl. 264-37.000.
Meek, Robert A.; and Linville, Andrew F., Jr., 5,067,112, Cl. 367-43.000.
Owen, Hartley; and Schipper, Paul H., 5,066,627, Cl. 502-43.000.

Mobley, Mark H. Bicycle rack for mounting on a van. 5,065,921, Cl. 224-324.000.

Model & Instrument Development Corporation: *See*—
Firth, David G., 5,066,305, Cl. 623-55.000.

Modic, Michael J., to Shell Oil Company. Process for melt grafting epoxy compounds to polymers. 5,066,726, Cl. 525-263.000.

Modlinski, Ulrich: *See*—
Lehnert, Michael; Modlinski, Ulrich; and Roess, Rudi, 5,065,613, Cl. 73-23.200.

Moellering, Harold J.; and Kimerling, A. Jon, to Ohio State University Research Foundation, The. Slope-aspect color shading for parametric surfaces. 5,067,098, Cl. 395-126.000.

Mohan, Manohar: *See*—
Gill, Sarupinderpal S.; and Mohan, Manohar, 5,065,535, Cl. 38-22.000.

Mohebban, Manoochehr; Montoya, Wayne; Parker, Robert; and Siden, Dennis C., to Raychem Corporation. Liquid crystal electrical fault indicators. 5,066,104, Cl. 359-43.000.

Mohr, Dieter: *See*—
Zertani, Rudolf; Mohr, Dieter; and Rode, Klaus, 5,066,564, Cl. 430-284.000.

Mokudai, Tsuyoshi: *See*—
Nakano, Hirofumi; Hara, Mitsunobu; Mokudai, Tsuyoshi; Kawamoto, Isao; Yoshida, Mayumi; and Kobayashi, Eiji, 5,066,817, Cl. 549-384.000.

Molex Incorporated: *See*—
Martucci, Roberto, 5,066,242, Cl. 439-281.000.

Monahan, Russell, to Gas Research Institute. Feedback air-fuel control system for Stirling engines. 5,065,579, Cl. 60-524.000.

Monogram Sanitation, a division of MAG Aerospace Industries, Inc.: *See*—
Rozenblatt, Mike M., 5,065,786, Cl. 137-202.000.

Montagnier, Luc; Chamaret, Solange; Guetard, Denise; Alizon, Marc; Clavel, Francois; Guyader, Mireille; Sonigo, Pierre; Brun-Vezinet, Francoise; Rey, Marianne; Rouzioux, Christine; and Katlama, Christine, to Institut Pasteur. Retrovirus capable of causing AIDS, means and method for detecting it in vitro. 5,066,782, Cl. 530-324.000.

Montoya, Wayne: *See*—
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Monzyk, Bruce F.; and Woodard, Lloyd A. Device for measuring subsurface temperatures of liquid bodies, useful for determining optimum fishing locations. 5,065,539, Cl. 43-4.000.

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Voss, Erdmuthe; Moschinsky, Werner; and Hofmann-Moritz, Doris, 5,066,640, Cl. 512-21.000.

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Reisinger, Lothar; Hagg, Dieter; Wenzl, Werner; and Walther, Klaus, 5,066,024, Cl. 277-53.000.

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Hallewell, Robert A.; and Mullenbach, Guy T., 5,066,591, Cl. 435-189.000.

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Kaneta, Hiroshi; and Muraishi, Shuichi, 5,066,599, Cl. 437-7.000.

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Maeda, Kenji; and Yamada, Nobuyuki, 5,065,807, Cl. 160-206.000.

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Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.

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Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.

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Otoshima, Hiroo, 5,065,950, Cl. 242-43.200.
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Tone, Shoichi, 5,065,949, Cl. 242-35.50R.

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Adams, William J.; Jex Courter, Barbara G.; Fong, Craig S.; Murray, Robert C.; and Marshall, Paul A., 5,065,962, Cl. 244-234.000.

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Felter, Richard E.; Markley, Dean A.; and Musser, Deborah L., 5,066,422, Cl. 252-511.000.

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Muto, Yoshihiko; Watanabe, Kohei; Yasukata, Koichi; and Sakurai, Tomoyuki, to Asahi Kasei Kogyo Kabushiki Kaisha. Hollow fiber membranes with fusion-bonded end portions. 5,066,397, Cl. 210-321.610.

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Furtak, Hans; Naber, Wilfrid; and Lejeune, Raymond, 5,065,478, Cl. 19-296.000.

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Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.
Bliss, Eric M.; and Wunder, William G., Sr., 5,066,211, Cl. 425-122.000.

Nader, Bassam S., to Dow Chemical Company, The. Novel aryl ether sulfones. 5,066,409, Cl. 252-48.200.

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Hara, Hiroyuki; Sugimoto, Yasuhiro; and Nagamatsu, Tetsu, 5,066,996, Cl. 357-43.000.

Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Reader for original documents and method. 5,067,168, Cl. 382-53.000.

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Noguchi, Takehiko; Sakubata, Takashi; and Nagano, Hirosaku, 5,066,770, Cl. 528-353.000.

Nagano, Katsumi, to Kabushiki Kaisha Toshiba. Wiring board for flat package type integrated circuit device. 5,067,042, Cl. 361-406.000.

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Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Nagase, Kazuhiko; and Nakamura, Hideki, to Niigata Converter Co., Ltd. Power transmission device. 5,065,645, Cl. 74-859.000.

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Nagashima, Toshiharu; and Yoshida, Kazuhiro, to Konica Corporation. Method of processing silver halide photographic materials. 5,066,569, Cl. 430-393.000.

Nagasubramanian, Ganesan; DiStefano, Salvador; and Liang, Ranty H., to United States of America, National Aeronautics and Space Administration. Silicon containing electroconductive polymers and structures made therefrom. 5,066,748, Cl. 526-258.000.

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Suzuki, Katsuhiro; Nishimura, Akira; Yamauchi, Takatsugu; Nagata, Kazuhisa; and Ochiai, Hironori, 5,066,068, Cl. 296-221.000.

Nagata, Osamu; and Makino, Kazumasa, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus with positional adjustment of exposure area according to image size. 5,066,972, Cl. 355-27.000.

Nagata, Tsuyoshi; and Okuda, Shinji, to Sunstar Engineering, Inc. Method of and apparatus for inspecting paint coating. 5,066,132, Cl. 356-432.000.

Nagatomi, Hisato: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.

Nagayasu, Hideaki: *See*—
Nakatani, Akihiro; and Nagayasu, Hideaki, 5,065,803, Cl. 152-543.000.

Nagy, William J.: *See*—
Fischer, Frederick H.; Lee, Kuo-hua; Nagy, William J.; and Selamoglu, Nur, 5,066,998, Cl. 357-51.000.
Nahar, Rathindra, to NCR Corporation. Removable window carrier for mounting in a scanner checkout counter. 5,065,842, Cl. 186-61.000.
Nahill, Thomas E.: *See*—
Krishnakumar, Suppayan M.; Collette, Wayne N.; and Nahill, Thomas E., 5,066,528, Cl. 428-36.920.
Naik, Rajan H.: *See*—
Kulkarni, Gurunath H.; Naik, Rajan H.; and Rajappa, Srinivasachari, 5,066,819, Cl. 549-438.000.
Nair, Muraleedharan G.: *See*—
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Naito, Tadaharu: *See*—
Shimizu, Fumio; Nishikubo, Yasutoshi; and Naito, Tadaharu, 5,065,520, Cl. 33-241.000.
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Ohnuma, Takeshi; Hoshi, Hideaki; Kamei, Hideo; and Naito, Takayuki, 5,066,645, Cl. 514-27.000.
Nakagawa, Kiyokazu: *See*—
Miyao, Masanobu; Nakagawa, Kiyokazu; Ohyu, Kiyonori; Murakami, Eiichi; and Ohshima, Takashi, 5,066,355, Cl. 156-612.000.
Nakagawa, Masaya: *See*—
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.
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Sakamoto, Hirokazu; Ohtani, Makoto; Nakagawa, Naoki; Maejima, Taro; and Hayama, Masahiro, 5,066,106, Cl. 359-59.000.
Nakagawa, Shiro; Domon, Taisuke; Imai, Takehiro; and Tsuchida, Atsuko, to TDK Corporation. Humidity meter. 5,065,625, Cl. 73-336.500.
Nakagawa, Toyoaki; and Nagaishi, Hatsuo, to Nissan Motor Company, Limited. Fuel supply control system for internal combustion engine with improved engine acceleration characterisitcs after fuel cut-off operation. 5,065,716, Cl. 123-326.000.
Nakagomi, Hiroshi: *See*—
Fukuda, Tsuguhiro; Nakagomi, Hiroshi; and Karita, Seiichirou, 5,066,964, Cl. 346-140.00R.
Nakahara, Kei: *See*—
Yoshimura, Hironori; Sawada, Yoshihiro; Nakahara, Kei; Kunugi, Hitoshi; and Sakurai, Keiichi, 5,066,553, Cl. 428-698.000.
Nakai, Kazuhiro: *See*—
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; Terada, Tsutomu; Yamana, Masayuki; Nakai, Kazuhiro; and Araki, Takayuki, 5,066,747, Cl. 526-249.000.
Nakajima, Masaya; and Sekine, Atsushi, to Nikon Corporation. Projecting lens. 5,066,113, Cl. 359-649.000.
Nakajima, Yoshihiro; Saito, Mitsuru; Hayashi, Tsutomu; Tsunoda, Tadashi; Yamazaki, Katsumi; Yoshida, Yoshihiro; and Nakamura, Kazuhiko, to Honda Giken Kogyo Kabushiki Kaisha. Hydrostatic continously variable transmission with adjustable clutch valve. 5,065,578, Cl. 60-464.000.
Nakamachi, Fumihiko; and Umebayashi, Masanori, to Central Glass Company, Limited. Laminated glass panel incorporating hologram sheet. 5,066,525, Cl. 428-29.000.
Nakamura, Hideki: *See*—
Nagase, Kazuhiko; and Nakamura, Hideki, 5,065,645, Cl. 74-859.000.
Nakamura, Hiroshi, to Fuji Photo Film Co., Ltd. Method of heating image formation sheet. 5,066,562, Cl. 430-203.000.
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Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 5,066,101, Cl. 359-638.000.
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Nakamura, Michihiro: *See*—
Tsuruta, Hitoshi; Yamada, Hideaki; and Nakamura, Michihiro, 5,066,582, Cl. 435-7.100.
Nakamura, Takashi; and Kurokawa, Toshio, to Fuji Photo Film Co., Ltd. Wet processing of silver halide photosensitive material. 5,066,570, Cl. 430-421.000.
Nakamura, Tomoyuki: *See*—
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Nakamura, Yuko: *See*—
Kotachi, Akiko; Takechi, Satoshi; and Nakamura, Yuko, 5,066,751, Cl. 526-279.000.
Nakane, Hiroshi, to Kabushiki Kaisha Toshiba. Recorded data reading system. 5,067,128, Cl. 371-5.500.
Nakane, Mototaka: *See*—
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.
Nakane, Satoshi: *See*—
Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, 5,066,344, Cl. 156-138.000.
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Tomioka, Yutaka; Nakanishi, Satoru; Shintake, Seizi; and Yoneda, Hideki, 5,066,333, Cl. 106-400.000.
Nakanishi, Yasushi; and Fukunaga, Takahiro, to Sharp Kabushiki Kaisha. System for controlling movement of a document table in a copying apparatus. 5,066,975, Cl. 355-200.000.
Nakaniwa, Shinpei, to Japan Electronic Control Systems Co., Ltd. System and method for controlling air/fuel mixture ratio of air and fuel mixture supplied to internal combustion engine using oxygen sensor. 5,065,728, Cl. 123-489.000.
Nakano, Hirofumi; Hara, Mitsunobu; Mokudai, Tsuyoshi; Kawamoto, Isao; Yoshida, Mayumi; and Kobayashi, Eiji, to Kyowa Hakko Kogyo Co., Ltd. DC115A compounds produced by streptomyces sp. 5,066,817, Cl. 549-384.000.
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, to Nippon Paint Co., Ltd. Heat-latent curing catalyst and resin compositions containing the same. 5,066,722, Cl. 525-162.000.
Nakano, Tadaaki: *See*—
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, 5,065,598, Cl. 62-330.000.
Nakashima, Shozaburo; Iwayama, Kenzo; and Iwanaga, Isao, to Nippon Steel Corporation. Process for preparation of thin grain oriented electrical steel sheet having superior iron loss and high flux density. 5,066,343, Cl. 148-111.000.
Nakata, Takashi; and Suzuki, Tauyoshi, to Brother Kogyo Kabushiki Kaisha. Auxiliary exposure device for image recording apparatus. 5,066,974, Cl. 355-71.000.
Nakatani, Akihiro; and Nagayasu, Hideaki, to Sumitomo Rubber Industries, Ltd. Tire and wheel rim assembly. 5,065,803, Cl. 152-543.000.
Nakaue, Akimitsu: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.
Nakayama, Okihiko; and Tsuda, Hiroshi, to Nissan Motor Co., Ltd. Vehicle driving azimuth detecting apparatus for correcting a disturbed geomagnetic azimuth. 5,067,083, Cl. 364-453.000.
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, to Hitachi, Ltd. Air-conditioner system. 5,065,588, Cl. 62-160.000.
Nakayama, Takehisa; Hayashi, Akimine; Kondo, Masataka; Murakami, Satoru; Yamaguchi, Minori; and Tawada, Yoshihisa, to Kanegafuchi Chemical Industry Co., Ltd. X ray detecting device. 5,066,861, Cl. 250-370.090.
Nakazawa, Masahisa, to Kabushiki Kaisha Toshiba. Circuit design conversion apparatus. 5,067,091, Cl. 364-490.000.
Nalco Chemical Company: *See*—
Reese, D. Dwaine; Sawyer, Roy D.; and Crow, Stanley G., 5,066,199, Cl. 417-63.000.
Namias, Charles S.: *See*—
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.
Nanaumi, Ken: *See*—
Kumakura, Toshihisa; Nanaumi, Ken; Ikezawa, Ryoichi; and Eriguchi, Hideki, 5,066,691, Cl. 523-438.000.
Nanba, Akimasa: *See*—
Nimura, Mitsuhiro; Nanba, Akimasa; and Yokoyama, Shoji, 5,067,082, Cl. 364-449.000.
Nang, Jin-Liang: *See*—
Favstritsky, Nicolai A.; and Nang, Jin-Liang, 5,066,752, Cl. 526-293.000.
Napier, George W. Escape system. 5,065,839, Cl. 182-47.000.
Narciso, Ralph A.: *See*—
Soderberg, Paulmer M.; Foss, Kristin K.; Giles, Thomas E.; and Narciso, Ralph A., 5,066,139, Cl. 371-20.100.
Narita, Akira: *See*—
Anzawa, Norio; Adachi, Koji; Futakawa, Tetsuo; Sato, Hironari; and Narita, Akira, 5,066,219, Cl. 431-10.000.
Naritomi, Hiromi; and Oshida, Tsutomu, to Nissan Motor Co., Ltd.; and Nifco Inc. Lid opener and container using same. 5,065,884, Cl. 220-264.000.
Narukawa, Atsushi: *See*—
Iwamoto, Ken; and Narukawa, Atsushi, 5,065,995, Cl. 271-9.000.
Narula, Anubhav P. S.; and DeVirgilio, John J., to International Flavors & Fragrances Inc. Cyclohexenylmethyloxabicyclooctanes, processes for preparing same, intermediates used in said processes and organoleptic uses of said cyclohexenylmethyloxabicyclooctanes and intermediates therefor. 5,066,639, Cl. 512-13.000.
Narula, Anubhav P. S.; De Virgilio, John J.; and Van Elst, Jan T., to International Flavors & Fragrances Inc. 3,5,5-trimethylhexanal oxime and organoleptic uses thereof. 5,066,641, Cl. 512-25.000.
Naruse, Hideaki: *See*—
Sato, Tadahisa; Takahashi, Osamu; Naruse, Hideaki; and Mizukawa, Yuki, 5,066,575, Cl. 430-558.000.

Narushima, Masaki; and Takao, Itaru, to Tokyo Electron Limited. Method for holding a plate-like member. 5,065,495, Cl. 29-559.000.

Nashiki, Masayuki, to Kabushiki Kaisha Okuma Tekkosho. Control method of induction motor and device therefor. 5,066,899, Cl. 318-807.000.

Nasu, Tadashi: *See*—
Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, 5,065,552, Cl. 52-1.000.

Natali, Alberto: *See*—
Moro, Luigi; Fiori, Achille; and Natali, Alberto, 5,066,495, Cl. 424-451.000.

National Institute for Research in Inorganic Materials: *See*—
Komatsu, Yu; Fujiki, Yoshinori; and Sasaki, Takayoshi, 5,066,404, Cl. 210-670.000.

National Products, Inc.: *See*—
Woodward, Bruce; and Hall, James, 5,066,080, Cl. 312-297.000.

National Semiconductor Corporation: *See*—
Cheah, Chun-Foong; and Skovmand, Timothy J., 5,066,901, Cl. 323-267.000.
Wilcox, Milton E., 5,066,871, Cl. 307-296.100.

National Starch and Chemical Investment Holding Corporation: *See*—
Leighton, John C.; Iovine, Carmine P.; Aronson, Michael P.; and Elliott, David L., 5,066,749, Cl. 526-271.000.

Nau, David R.: *See*—
Ramsden, Hugh E.; and Nau, David R., 5,066,395, Cl. 210-198.200.

Navoczynski, Stanley J.: *See*—
Yurgevich, Howard J.; and Navoczynski, Stanley J., 5,066,066, Cl. 296-181.000.

Naylor, Alan: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.

NCR Corporation: *See*—
Nahar, Rathindra, 5,065,842, Cl. 186-61.000.

NEC Corporation: *See*—
Fukuda, Shinri; and Ishii, Eiichi, 5,066,876, Cl. 307-475.000.
Inagaki, Masaru; and Matsushita, Toshio, 5,067,151, Cl. 379-433.000.
Kaneko, Ichiro, 5,067,137, Cl. 375-14.000.
Kobatake, Hiroyuki, 5,066,870, Cl. 307-296.100.
Kobayashi, Fumiyuki, 5,066,235, Cl. 439-76.000.
Okamura, Hitoshi, 5,067,003, Cl. 357-68.000.
Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, 5,065,941, Cl. 439-264.000.
Takahashi, Yasushi, 5,066,908, Cl. 324-158.00R.

Neefe, Charles W.: *See*—
Briggs, Charles R.; and Neefe, Charles W., 5,066,431, Cl. 264-2.100.

Neff, John P.: *See*—
Kennedy, Francis A.; Neff, John P.; and Blake, Kenneth J., 5,066,440, Cl. 264-69.000.

Negri, Febo R.; and Tomasini, Ercole, to Biomedic S.r.l. Method of removing pulp with an alkaline product. 5,066,232, Cl. 433-224.000.

Neidorff, Robert A., to Unitrode Corporation. Reset circuit with PNP saturation detector. 5,066,869, Cl. 307-272.300.

Nellums, Richard A., to Eaton Corporation. Self-energizing splines for a synchronizer. 5,065,855, Cl. 192-53.00E.

Nelson, Linda H., to General Electric Company. Composition. 5,066,707, Cl. 524-490.000.

Nemarov, Alexandr A.: *See*—
Zlobin, Mikhail N.; Metsik, Viktor M.; Nemarov, Alexandr A.; Permyakov, Georgy P.; and Taraban, Nikolai T., 5,066,389, Cl. 209-170.000.

Nemoto, Shigehisa: *See*—
Takagi, Tadao; Saya, Daisuke; and Nemoto, Shigehisa, 5,066,884, Cl. 310-323.000.

NeoRx Corporation: *See*—
Sivam, Gowsala P.; Reed, Michael W.; Srinivasan, Ananthachari; Morgan, A. Charles, Jr.; Brixner, Diana I.; Vrudhula, Vivekananda M.; and Comezoglu, F. Taha, 5,066,789, Cl. 530-388.000.

Nepi Campitelli, Giovanni: *See*—
Travanti Corinti, Mariano; and Nepi Campitelli, Giovanni, 5,066,193, Cl. 415-201.000.

Neva, Pertti; and Lindberg, Ralf. Shell structure. 5,065,554, Cl. 52-82.000.

Neville, David M., Jr.; and Srinivasachar, Kasturi, to United States of America, Health & Human Services. Protein crosslinking reagents cleavable within acidified intracellular vesicles. 5,066,490, Cl. 424-85.910.

New, David A., to RCA Thomson Licensing Corp. Color picture tube having an inline electron gun with an astigmatic prefocusing lens. 5,066,887, Cl. 313-414.000.

New York University: *See*—
Rapoport, David M., 5,065,756, Cl. 128-204.180.

Newell Industry International: *See*—
Newell, Robert D., 5,066,527, Cl. 428-35.600.

Newell, Robert D., to Newell Industry International. Sorptive article. 5,066,527, Cl. 428-35.600.

Newman, Carl M. Cutting tool assembly. 5,066,175, Cl. 408-231.000.

NGK Insulators, Ltd.: *See*—
Fukao, Kaname; Hamanaka, Toshiyuki; Harada, Takashi; and Kondo, Noboru, 5,066,626, Cl. 501-128.000.
Kato, Shigeki; and Inoue, Katsuhiro, 5,066,449, Cl. 264-406.000.

NGK Spark Plug Co., Ltd.: *See*—
Ishida, Noboru; Ito, Masaya; and Kawamura, Mitsuyoshi, 5,066,547, Cl. 428-627.000.
Ito, Kenji; Shimizu, Hiroyuki; and Wakita, Naomasa, 5,066,934, Cl. 333-205.000.

Nguyne, Alvin D.: *See*—
Hayden, Terry F.; Hicks, Christopher A.; Ledermann, Peter G.; Nguyne, Alvin D.; Steinbach, Stephen C.; and Yu, Stanley K., 5,065,932, Cl. 228-55.000.

Nicholas, Nicholas J.: *See*—
Mousseau, Carlton R.; DiBello, Louis M.; and Nicholas, Nicholas J., 5,065,862, Cl. 206-151.000.

Nichols, Lawrence R.: *See*—
Castrigno, Steven; Rafferty, Scott E.; Nichols, Lawrence R.; and Bemis, Claude, 5,066,037, Cl. 280-732.000.

Nichols, Michael: *See*—
Kozak, Mark; and Nichols, Michael, 5,066,295, Cl. 606-47.000.

Nieh, Li S.: *See*—
Glasser, Wolfgang G.; De Oliveira, Willer; Kelley, Stephen S.; and Nieh, Li S., 5,066,790, Cl. 530-502.000.

Nielsen, Kenneth A.: *See*—
Cole, Thomas A.; and Nielsen, Kenneth A., 5,066,522, Cl. 427-422.000.

Nienhaus, Clemens: *See*—
Flanhardt, Michael; Roth, Andreas; and Nienhaus, Clemens, 5,065,639, Cl. 74-417.000.

Niewiarowski, Stefan: *See*—
Huang, Tur-Fu; Niewiarowski, Stefan; Holt, John C.; and Lukasiewicz, Hanna, 5,066,592, Cl. 435-240.200.

Nifco Inc.: *See*—
Naritomi, Hiromi; and Oshida, Tsutomu, 5,065,884, Cl. 220-264.000.

Nihon Den-Netsu Keiki Co., Ltd.: *See*—
Kondo, Kenshi, 5,066,850, Cl. 219-388.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, 5,066,808, Cl. 514-231.500.

Niigata Converter Co., Ltd.: *See*—
Nagase, Kazuhiko; and Nakamura, Hideki, 5,065,645, Cl. 74-859.000.

Niikawa, Kenji: *See*—
Hiraoka, Saburo; and Niikawa, Kenji, 5,066,768, Cl. 528-230.000.

Niimura, Toshinobu: *See*—
Kano, Tokio; Niimura, Toshinobu; and Yonekawa, Hiroyuki, 5,066,465, Cl. 422-58.000.

Niita, Kaneaki: *See*—
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, 5,066,539, Cl. 428-328.000.

Niiyama, Takahiro: *See*—
Morimoto, Kiyoshi; Itoh, Shigeo; Tonegawa, Takeshi; and Niiyama, Takahiro, 5,066,885, Cl. 313-340.000.

Nikon Corporation: *See*—
Kodaka, Yoshiro; and Takabayashi, Kiyonobu, 5,066,103, Cl. 359-823.000.
Nakajima, Masaya; and Sekine, Atsushi, 5,066,113, Cl. 359-649.000.
Takagi, Tadao; Saya, Daisuke; and Nemoto, Shigehisa, 5,066,884, Cl. 310-323.000.

Niles Parts Co., Ltd.: *See*—
Ikeda, Yukio, 5,066,316, Cl. 55-122.000.

Nimura, Mitsuhiro; Nanba, Akimasa; and Yokoyama, Shoji, to Aisin AW Co., Ltd.; and Kabushiki Kaisha Shinsangyokaihatsu. Navigation apparatus. 5,067,082, Cl. 364-449.000.

Nippon Electric Glass Co., Ltd.: *See*—
Baba, Yasuhiro; and Moritake, Masanori, 5,066,524, Cl. 428-15.000.

Nippon Ferrofluidics Corporation: *See*—
Yamamura, Akira, 5,066,879, Cl. 310-90.500.

Nippon Oil and Fats Company, Limited: *See*—
Suyama, Shuji; and Nakamura, Tomoyuki, 5,066,744, Cl. 526-228.000.

Nippon Paint Co., Ltd.: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.

Nippon Petrochemicals Company, Ltd.: *See*—
Bommer, Jerry C.; and Burnham, Bruce F., 5,066,274, Cl. 604-20.000.

Nippon Polyurethane Industry Co., Ltd.: *See*—
Ohbuchi, Yukio; Maeda, Yoshiaki; Kawasaki, Masahiro; Sato, Susumu; and Akimoto, Mamoru, 5,066,762, Cl. 528-85.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Tokugawa, Osamu, 5,066,043, Cl. 280-808.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Oyoshi, Keiji, 5,066,514, Cl. 427-38.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Kitano, Masao; Yagisawa, Mitsuaki; and Morimoto, Yutaka, 5,066,813, Cl. 548-182.000.

Nippon Soken, Inc.: *See*—
Osada, Masahiko; Arai, Masumi; and Akita, Shigeyuki, 5,066,893, Cl. 315-169.300.

Nippon Steel Chemical Co., Ltd.: *See*—
Wada, Keiichiro; Cassidy, Patrick E.; and Hager, William S., 5,066,765, Cl. 528-185.000.
Nippon Steel Corporation: *See*—
Anzawa, Norio; Adachi, Koji; Futakawa, Tetsuo; Sato, Hironari; and Narita, Akira, 5,066,219, Cl. 431-10.000.
Mizoguchi, Toshiaki; and Miyazawa, Kenichi, 5,065,812, Cl. 164-480.000.
Nakashima, Shozaburo; Iwayama, Kenzo; and Iwanaga, Isao, 5,066,343, Cl. 148-111.000.
Tanemoto, Kei; Ando, Akiro; and Kubo, Hiroshi, 5,066,617, Cl. 501-134.000.
Nippon Telegraph & Telephone Corp.: *See*—
—Sugano, Minoru; Horiki, Akira; Yashiro, Zenichi; and Matsushima, Hironori, 5,067,075, Cl. 395-425.000.
Nippon Thompson Co., Ltd.: *See*—
Ito, Kenichi, 5,065,934, Cl. 228-112.000.
Nippondenso Co., Ltd.: *See*—
—Suzuki, Atsushi; and Kondo, Toshio, 5,065,718, Cl. 123-339.000.
Nishida, Hirobumi, to Ricoh Company, Ltd. Character recognition method. 5,067,165, Cl. 382-19.000.
Nishida, Masamitsu; Ando, Hamae; and Kugimiya, Koichi, to Matsushita Electric Industrial Co., Ltd. Media agitating mill and method for milling ceramic powder. 5,065,946, Cl. 241-16.000.
Nishihara, Seiji: *See*—
Murakami, Yoshiaki; and Nishihara, Seiji, 5,065,967, Cl. 248-161.000.
Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Tandem master cylinder with limited-motion booster piston at pedal-remote end of master cylinder and with booster fluid cut valve. 5,065,580, Cl. 60-547.100.
Nishii, Michiharu: *See*—
Nomura, Yoshihisa; Kato, Masahiko; and Nishii, Michiharu, 5,065,573, Cl. 60-551.000.
Nishikaku, Fumio: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,066,666, Cl. 514-380.000.
Nishikawa, Kinsaku; Yokoyama, Hiroshi; and Takahashi, Masami, to Unitika Limited. Method of making polyester fibers. 5,066,439, Cl. 264-103.000.
Nishikawa, Seigo; Okumura, Shinji; Amano, Tadayuki; and Hata, Kazutoshi, to Kabushiki Kaisha Yaskawa Denkiseisakusho. Automatic copying method for a welding torch in an arc welding robot. 5,066,848, Cl. 219-124.340.
Nishikawa, Yukio: *See*—
Yoshida, Yoshikazu; Tanaka, Kunio; and Nishikawa, Yukio, 5,065,697, Cl. 118-719.000.
Nishikubo, Yasutoshi: *See*—
Shimizu, Fumio; Nishikubo, Yasutoshi; and Naito, Tadaharu, 5,065,520, Cl. 33-241.000.
Nishimoto, Yoshifumi: *See*—
Kataoka, Kenichi; Nishimoto, Yoshifumi; Igaki, Masahiko; and Yanagi, Eiichi, 5,065,999, Cl. 271-265.000.
Nishimura, Akira: *See*—
Suzuki, Katsuhiro; Nishimura, Akira; Yamauchi, Takatsugu; Nagata, Kazuhisa; and Ochiai, Hironori, 5,066,068, Cl. 296-221.000.
Nishimura, Eiichiro: *See*—
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.
Nishimura, Isao: *See*—
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.
Nishimura, Masahiro: *See*—
Mikami, Kazuo; Ishihara, Hideshi; Nishimura, Masahiro; Tsukiyama, Noriyuki; and Hinoda, Seisuke, 5,067,161, Cl. 382-1.000.
Nishimura, Tetsuharu: *See*—
Ishii, Satoshi; Tsukiji, Masaaki; Nishimura, Tetsuharu; and Ishizuka, Koh, 5,067,089, Cl. 364-486.000.
Tsukiji, Masaaki; Nishimura, Tetsuharu; Ishizuka, Koh; Ishii, Satoshi; and Kubota, Yoichi, 5,066,130, Cl. 356-356.000.
Nishimura, Yasushi: *See*—
Ishida, Kohji; Nishimura, Yasushi; and Yamaguchi, Shigeru, 5,067,157, Cl. 381-13.000.
Nishimyou, Teruyuki: *See*—
Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, 5,066,201, Cl. 417-222.00R.
Nishino, Tetsuo: *See*—
Hyodo, Ryuji; Iwabuchi, Eisuke; Nishino, Tetsuo; Isono, Osamu; Tachibana, Tetsuo; and Fukui, Toshimasa, 5,067,123, Cl. 370-58.100.
Nishio, Hiroaki: *See*—
Sato, Michitaka; and Nishio, Hiroaki, 5,066,438, Cl. 264-56.000.
Nishio, Yukio: *See*—
Watarai, Shinichi; Yasuda, Megumi; Houki, Yoji; and Nishio, Yukio, 5,066,978, Cl. 355-206.000.
Nishiyama, Hiromi: *See*—
Arai, Kunio; Nishiyama, Hiromi; Aoyama, Hiroshi; and Kanaya, Yasuhiko, 5,066,171, Cl. 408-1.00R.
Nishiyama, Shigeru; and Amano, Hide, to Kubota Corporation. Engine with mechanical governor and decompression device. 5,065,720, Cl. 123-363.000.
Nissan Motor Co., Ltd.: *See*—
Doi, Kazuhiro; Fujiwara, Yasuhiko; Abe, Toshiro; and Matsui, Shinichi, 5,065,869, Cl. 207-140.100.
Ebihara, Yasuhiro; Sakaniwa, Hiroyuki; and Saito, Hiroshi, 5,065,494, Cl. 29-525.200.
Furuta, Katsumi; and Yamaguchi, Takashi, 5,066,057, Cl. 293-121.000.
Kasai, Junichi; Yagihashi, Wataru; Yatsunami, Akira; and Kurano, Kazuyuki, 5,067,159, Cl. 381-90.000.
Murakami, Shinichi, 5,065,831, Cl. 180-55.000.
Nakagawa, Toyoaki; and Nagaishi, Hatsuo, 5,065,716, Cl. 123-326.000.
Nakayama, Okihiko; and Tsuda, Hiroshi, 5,067,083, Cl. 364-453.000.
Naritomi, Hiromi; and Oshida, Tsutomu, 5,065,884, Cl. 220-264.000.
Sakaguchi, Shigeyuki; Ariga, Tadashi; and Maruyama, Hirotsugu, 5,065,727, Cl. 123-489.000.
Nitta Industries Corporation: *See*—
Inami, Junichi; Kikuta, Koozi; Nakane, Satoshi; Fujito, Kazumi; and Hirosawa, Hitoshi, 5,066,344, Cl. 156-138.000.
Nivarox-FAR S. A.: *See*—
Grenouillet, Guy, 5,066,341, Cl. 148-11.50C.
Niver, Michael A., to Huffy Corporation. Differential breakaway basketball goal. 5,066,007, Cl. 273-1.50R.
Niwa, Naoki: *See*—
Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, 5,065,552, Cl. 52-1.000.
NKK Corporation: *See*—
Sato, Michitaka; and Nishio, Hiroaki, 5,066,438, Cl. 264-56.000.
Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, 5,065,985, Cl. 266-156.000.
Yanaka, Hideomi; and Ohno, Yotaro, 5,066,327, Cl. 75-770.000.
Nobel, Fred I.; and Ostrow, Barnet D., to Learonal Inc. Limiting tin sludge formation in tin or tin/lead electroplating solutions. 5,066,367, Cl. 204-44.400.
Noda, Atsuhito: *See*—
Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, 5,065,941, Cl. 439-264.000.
Nodvik, Robert L.: *See*—
Tjahaja, Surja; and Nodvik, Robert L., 5,065,459, Cl. 4-144.200.
Noe, James B.: *See*—
Knox, Benjamin H.; and Noe, James B., 5,066,447, Cl. 264-290.500.
Noguchi, Masahiro: *See*—
Omure, Yukio; Fujiwara, Katsuki; Tsuchiya, Tatsumi; Hishida, Satoshi; Noguchi, Masahiro; and Yamamoto, Ikuo, 5,066,410, Cl. 252-68.000.
Noguchi, Takehiko; Sakubata, Takashi; and Nagano, Hirosaku, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process and apparatus for manufacturing polymers. 5,066,770, Cl. 528-353.000.
Nohira, Hiroyuki; Onishi, Takashi; Yamamoto, Kazuo; and Kumagai, Noriaki, to Kuraray Company, Ltd. Process for racemization of optically active 4-phenylbutanoic acid esters. 5,066,826, Cl. 560-60.000.
Nomura, Ichiro: *See*—
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,066,883, Cl. 313-309.000.
Nomura, Yoshihisa; Kato, Masahiko; and Nishii, Michiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Hydraulic power booster including backup actuator in addition to lever device, for booster control valve. 5,065,573, Cl. 60-551.000.
Norbury, Robert J.: *See*—
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De Bortoli, Giuseppe, 5,065,480, Cl. 24-68.0SK.
Gorza, Roberto, 5,065,532, Cl. 36-117.000.
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Baron, Carl N.; Merkel, Stephen L.; and Hall, Robert C., 5,065,695, Cl. 118-688.000.
Boger, Bentley J.; and Jenkins, Thomas C., 5,065,943, Cl. 239-298.000.
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Hazan, Isidor; and Nordstrom, John D., 5,066,698, Cl. 524-269.000.
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Hamada, Tetsuro; Noro, Yoshiki; and Ashikawa, Noboru, 5,065,836, Cl. 180-245.000.
Norris, Jeffrey J.: *See*—
Zoller, Jon P.; and Norris, Jeffrey J., 5,066,841, Cl. 200-342.000.
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Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 5,067,011, Cl. 358-23.000.
Harper, George S., 5,066,935, Cl. 335-172.000.
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Lehto, John M., 5,066,325, Cl. 75-499.000.
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Sayo, Noboru; Kumobayashi, Hidenori; Akutagawa, Susumo; Noyori, Ryoji; and Takaya, Hidemasa, 5,066,815, Cl. 549-319.000.
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Isaacson, Milton S.; Holmes, Donald E.; and Lioi, Anthony P., 5,066,300, Cl. 623-3.000.
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Martin, Norman D., 5,065,544, Cl. 49-177.000.
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Kunz, Walter; Schurter, Rolf; and Nyfeler, Robert, 5,066,661, Cl. 514-361.000.
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Block, Michael S.; and Hoffman, David R., 5,066,224, Cl. 433-7.000.
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Isawa, Yamahiro; Morooka, Isao; and Oba, Yoichi, 5,066,692, Cl. 523-458.000.
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Gupta, Manoj K., 5,066,693, Cl. 523-466.000.
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O'Connor, Kevin M.; Szajewski, Richard P.; and Bagchi, Pranab, to Eastman Kodak Company. Control of pressure-fog with gelatin-grafted and case-hardened gelatin-grafted soft polymer latex particles. 5,066,572, Cl. 430-503.000.
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Petrillo, Richard J.; and O'Connor, William T., 5,066,156, Cl. 401-213.000.
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Ruozi, Giuseppe, 5,066,503, Cl. 426-234.000.
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Lane, Christopher C.; Lenz, Ruben P.; and Athanassoulias, Costa, 5,066,335, Cl. 134-7.000.
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Ohata, Koichi: *See*—
Kurisu, Yoshitaka; Kimura, Hiroshi; Mukae, Masakatsu; Aiba, Kazuyuki; Hosaka, Yukihiro; Ohata, Koichi; Nakano, Tadaaki; and Ikeuchi, Masaki, 5,065,598, Cl. 62-330.000.
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Moellering, Harold J.; and Kimerling, A. Jon, 5,067,098, Cl. 395-126.000.
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Yoshinaga, Kazuo; Keneko, Shuzo; Kai, Takashi; Isaka, Kazuo; and Ohnishi, Toshikazu, 5,066,107, Cl. 359-45.000.
Ohno, Yotaro: *See*—
Yanaka, Hideomi; and Ohno, Yotaro, 5,066,327, Cl. 75-770.000.
Ohnuma, Takeshi; Hoshi, Hideaki; Kamei, Hideo; and Naito, Takayuki, to Bristol-Myers Company. Epipodophyllotoxin altroside derivatives. 5,066,645, Cl. 514-27.000.
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Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, 5,066,384, Cl. 208-45.000.
Ohshima, Takashi: *See*—
Miyao, Masanobu; Nakagawa, Kiyokazu; Ohyu, Kiyonori; Murakami, Eiichi; and Ohshima, Takashi, 5,066,355, Cl. 156-612.000.
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, to Nippon Paint Co., Ltd.; and Shinetsu Chemical Industries, Ltd. Resinous composition for coating use. 5,066,720, Cl. 525-100.000.
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Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, to Sharp Kabushiki Kaisha; and Mitsubishi Metal Corporation. Target unit. 5,066,381, Cl. 204-298.120.
Ohta, Koziro; Kurogi, Yoshihito; and Suzuki, Yasuo, to Kitagawa Iron Works Co., Ltd. Coupling mechanisms for rotary fluid cylinders. 5,065,792, Cl. 137-580.000.
Ohta, Shuji; and Takeuchi, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Control circuit for a cylinder allowing flow between an upper and a lower chamber. 5,065,664, Cl. 91-420.000.
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Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, 5,066,982, Cl. 355-269.000.
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Sakamoto, Hirokazu; Ohtani, Makoto; Nakagawa, Naoki; Maejima, Taro; and Hayama, Masahiro, 5,066,106, Cl. 359-59.000.
Ohtsuka, Masaru: *See*—
Iwata, Mikio; Kariya, Takao; and Ohtsuka, Masaru, 5,066,131, Cl. 356-401.000.
Ohtsuka, Masuhiro: *See*—
Kono, Hiromi; and Ohtsuka, Masuhiro, 5,065,849, Cl. 192-0.076.
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Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, 5,066,574, Cl. 430-557.000.
Ohyu, Kiyonori: *See*—
Miyao, Masanobu; Nakagawa, Kiyokazu; Ohyu, Kiyonori; Murakami, Eiichi; and Ohshima, Takashi, 5,066,355, Cl. 156-612.000.
Oiles Corporation: *See*—
Ozora, Kazuo, 5,065,493, Cl. 29-505.000.
Oka, Joji: *See*—
Miyabayashi, Shigeaki; Sakamoto, Takuro; Kanai, Hiroshi; and Oka, Joji, 5,066,757, Cl. 528-45.000.
Okabe, Masami, to Hoffmann-La Roche Inc. Quinoline intermediates useful therein for synthesizing antibacterial compounds. 5,066,800, Cl. 540-471.000.
Okajima, Shigeru: *See*—
Takahara, Katsuo; Okajima, Shigeru; and Onodera, Tugio, 5,065,605, Cl. 72-340.000.
Okamoto, Yoshihisa; and Klemarczyk, Philip T., to Loctite Corporation. Two-part composition comprising a cyanoacrylate adhesive and a primer comprising a tertiary ammonium carboxylate compound. 5,066,743, Cl. 526-215.000.

Okamura, Hitoshi, to NEC Corporation. Semicustom-made semiconductor integrated circuit having interface circuit selectively coupled to different voltage source. 5,067,003, Cl. 357-68.000.

Okamura, Yoshio: *See*—
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.

Okinaga, Takayuki: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.

Okine, Richard K.: *See*—
Gutowski, Timothy G.; Sentovich, Michael F.; and Okine, Richard K., 5,066,442, Cl. 264-154.000.

Okubo, Atsuo: *See*—
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Okuda, Shinji: *See*—
Nagata, Tsuyoshi; and Okuda, Shinji, 5,066,132, Cl. 356-432.000.

Okumura, Kazuo: *See*—
Shiokawa, Youichi; Okumura, Kazuo; Take, Kazuhiko; and Tsubaki, Kazunori, 5,066,680, Cl. 514-622.000.

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Nishikawa, Seigo; Okumura, Shinji; Amano, Tadayuki; and Hata, Kazutoshi, 5,066,848, Cl. 219-124.340.

Okunishi, Hiromu: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Olin Corporation: *See*—
Lin, Lifun, 5,066,366, Cl. 204-12.000.
Martin, Douglas R., 5,066,416, Cl. 252-90.000.
Pasqualoni, Anthony M.; Mahulikar, Deepak; Jalota, Satish K.; and Brock, Andrew J., 5,066,368, Cl. 204-58.000.

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Brandenstein, Manfred; and Olschewski, Armin, 5,066,147, Cl. 384-585.000.

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Babler, Egon S.; Gottwald, Johannes F.; Gruber, Dennis W.; Kearney, James F.; Mayer, William J.; and Olsen, Alf J., 5,066,150, Cl. 400-157.300.

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Olympus Optical Co., Ltd.: *See*—
Kano, Tokio; Niimura, Toshinobu; and Yonekawa, Hiroyuki, 5,066,465, Cl. 422-58.000.
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Omata, Satoshi; Shimizu, Hiroshi; and Yamaguchi, Yoko, to Canon Kabushiki Kaisha. Motion-pattern recognition apparatus. 5,067,160, Cl. 382-1.000.

Omori, Katsuhisa; and Yamashita, Masaya, to Siemens-Asahi Medical System, Ltd. RF coil positioning device for MRI. 5,066,915, Cl. 324-318.000.

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Mikami, Kazuo; Ishihara, Hideshi; Nishimura, Masahiro; Tsukiyama, Noriyuki; and Hinoda, Seisuke, 5,067,161, Cl. 382-1.000.

Omure, Yukio; Fujiwara, Katsuki; Tsuchiya, Tatsumi; Hishida, Satoshi; Noguchi, Masahiro; and Yamamoto, Ikuo, to Daikin Industries, Ltd. Refrigerating machine composition comprising a fluorine-containing polyether oil. 5,066,410, Cl. 252-68.000.

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O'Neill, Mark D. Method of playing a box-office movie game. 5,066,016, Cl. 273-249.000.

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Braun, Stephen A.; O'Neill, Michael J.; and Cutshall, Donald L., 5,065,568, Cl. 56-14.900.

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Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.

Onishi, Takashi: *See*—
Nohira, Hiroyuki; Onishi, Takashi; Yamamoto, Kazuo; and Kumagai, Noriaki, 5,066,826, Cl. 560-60.000.

Onodera, Tugio: *See*—
Takahara, Katsuo; Okajima, Shigeru; and Onodera, Tugio, 5,065,605, Cl. 72-340.000.

Ooba, Takeshi: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

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Ooka, Kazuo, to Ansimag, Inc. Double containment pumping system for pumping hazardous materials. 5,066,200, Cl. 417-63.000.

Oomen, Emmanuel W. J. L., to U.S. Philips Corp. Device for generating blue laser light. 5,067,134, Cl. 372-6.000.

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Seo, Ikuo; Oono, Tooru; and Murakami, Yosinobu, 5,066,779, Cl. 528-396.000.

Optoswitch, Inc.: *See*—
Crouse, Ronald J., 5,066,856, Cl. 250-229.000.

Orama, Angel: *See*—
Cherukuri, Subraman R.; Raman, Kirschna P.; Wong, Lucy L.; Mansukhani, Gul; and Orama, Angel, 5,066,511, Cl. 426-658.000.

O'Rell, Dennis; Hamed, Parviz; and DiPerna, Thomas C., to W. R. Grace & Co.-Conn. Printing blanket containing a high elongation fabric. 5,066,537, Cl. 428-246.000.

Origin Electric Co., Ltd.: *See*—
Watanabe, Kiyomi; and Matsumoto, Tetsuya, 5,067,143, Cl. 378-110.000.

Orth, Winfried: *See*—
Pastorek, Emmerich; Orth, Winfried; Weiss, Wolfgang; and Kleffner, Hans W., 5,066,806, Cl. 546-180.000.

Ortho Pharmaceutical Corporation: *See*—
Demers, James P.; and Sulsky, Richard B., 5,066,658, Cl. 514-269.000.

Ortmann, Hubert: *See*—
Haeussler, Horst; Ortmann, Hubert; and Stoerr, Harald, 5,065,797, Cl. 139-448.000.

Ortyl, Nicholas E., III: *See*—
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Osada, Masahiko; Arai, Masumi; and Akita, Shigeyuki, to Nippon Soken, Inc. Driving circuit for an electroluminescence device. 5,066,893, Cl. 315-169.300.

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Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, 5,066,201, Cl. 417-222.00R.

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Flisram, Dennis G., 5,065,656, Cl. 83-356.003.

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Naritomi, Hiromi; and Oshida, Tsutomu, 5,065,884, Cl. 220-264.000.

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Satomi, Mitsuo; Oshita, Kazuaki; and Kuwahara, Tetsuya, 5,067,150, Cl. 379-354.000.

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Ostermann, Friedrich; Plath, Hans-Heinrich; and Griep, Winfried, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method for the manufacture of a light metal vehicle wheel. 5,065,510, Cl. 29-894.324.

Ostrem, John S.: *See*—
Green, Philip S.; Ostrem, John S.; and Whitehurst, Todd K., 5,065,763, Cl. 128-660.070.

Ostrow, Barnet D.: *See*—
Nobel, Fred I.; and Ostrow, Barnet D., 5,066,367, Cl. 204-44.400.

Otari Electric Co. Ltd.: *See*—
Yoshida, Hirokazu, 5,066,347, Cl. 156-159.000.

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Richards, Douglas, 5,065,843, Cl. 187-1.00R.

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Cooksey, Andrew G.; and Reesing, David L., 5,066,060, Cl. 294-86.180.
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Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor device having leads for mounting to a surface of a printed circuit board. 5,067,007, Cl. 357-74.000.

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Ottestad, Jack B., to Esco Corporation. Hydraulically powered repetitive impact hammer. 5,065,824, Cl. 173-134.000.

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Berryer, Michel, 5,066,170, Cl. 407-54.000.
Broughton, George L.; Binversie, Gregory B.; and Billingsley, Henry C., 5,065,723, Cl. 123-413.000.

Overton, Santford V.: *See—*
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DiFrank, Frank J., 5,065,565, Cl. 53-398.000.
Mousseau, Carlton R.; DiBello, Louis M.; and Nicholas, Nicholas J., 5,065,862, Cl. 206-151.000.

Owens, William F., Jr., to P. H. Glatfelter Company. Thermally stable ash conditioners for cigarette paper, methods of making such cigarette paper and smoking articles made from such wrappers—case III. 5,065,777, Cl. 131-365.000.

Oxford, Alexander W.; Coates, Ian H.; and Butina, Darko, to Glaxo Group Limited. Indole derivatives. 5,066,660, Cl. 514-323.000.

Oxley Developments Company Limited: *See—*
Edwards, Geoffrey S., 5,066,889, Cl. 313-512.000.

Oxman, Joel D.; and Ubel, F. Andrew, III, to Minnesota Mining and Manufacturing Company. Dental impression process using polycaprolactone molding composition. 5,066,231, Cl. 433-214.000.

Oyama, Minoru; and Furudate, Misturu, to Alps Electric Co., Ltd. Illuminated electrical part. 5,067,050, Cl. 362-30.000.

Oyama, Noboru: *See—*
Yamaguchi, Shuichiro; Shimomura, Takeshi; Uchida, Naoto; Katsube, Teruaki; and Oyama, Noboru, 5,066,383, Cl. 204-435.000.

Oyoshi, Keiji, to Nippon Sheet Glass Co., Ltd. Method of forming optical waveguides by ion implantation. 5,066,514, Cl. 427-38.000.

Ozaki, Hiroji: *See—*
Eimori, Takahisa; Satoh, Shinichi; Wakamiya, Wataru; Ozaki, Hiroji; and Tanaka, Yoshinori, 5,067,000, Cl. 357-53.000.

Ozaki, Shinya: *See—*
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,067,131, Cl. 371-40.100.

Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, to Sumitomo Pharmaceuticals Company, Limited. Aminoazole derivatives and their production and use. 5,066,666, Cl. 514-380.000.

Ozawa, Kazunori: *See—*
Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, 5,065,547, Cl. 51-154.000.
Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, 5,065,548, Cl. 51-154.000.

Ozawa, Tsugutaro, to Hitachi, Ltd. Cassette loading mechanism for accommodating cassettes of various sizes. 5,067,036, Cl. 360-96.500.

Ozora, Kazuo, to Oiles Corporation. Method of making a spherical sealing body used for exhaust pipe joint. 5,065,493, Cl. 29-505.000.

P.C.E. Corp.: *See—*
Cloeren, Peter F., 5,066,443, Cl. 264-171.000.

P. H. Glatfelter Company: *See—*
Owens, William F., Jr., 5,065,777, Cl. 131-365.000.

Pacific Monolithics: *See—*
Ramachandran, Ravi; and Podell, Allen F., 5,066,926, Cl. 330-311.000.

Packard Industries, Inc.: *See—*
Mark, Edward H., 5,065,832, Cl. 108-60.000.

PacTel Corporation: *See—*
Lee, William C., 5,067,147, Cl. 379-60.000.

Padera, Robert F.; and Miller, Daniel C., to Culligan International Company. Slotted flow collector/distributor for water treatment tank with one-way valves. 5,066,393, Cl. 210-136.000.

Pagella, Piergiuseppe: *See—*
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 5,066,802, Cl. 544-32.000.

Palazzo, Raymond E., Jr.: *See—*
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,065,791, Cl. 137-515.000.

Palepu, Nageswara R.; and Hutt, Julie A., to Erbamont, Inc. Cyclophosphamide - alanine lyophilizates. 5,066,647, Cl. 514-110.000.

Palermo, Anthony C.: *See—*
Martz, Jonathan T.; Kelly, Thomas W.; Dowbenko, Rostyslaw; Meier, James A.; and Palermo, Anthony C., 5,066,733, Cl. 525-455.000.

Palfray, Michel, to Etablissements Proteor. Apparatus for plotting the configuration of a lower limb of the human body with a view to producing an orthesis for paraplegic. 5,065,770, Cl. 128-774.000.

Pampalone, Thomas R., to Hoechst Celanese Corporation. Method for producing and using a positive photoresist with o-quinone diazide, novolak, and propylene glycol alkyl ether acetate. 5,066,561, Cl. 430-169.000.

Panduit Corp.: *See—*
Alletto, John S.; and Maurer, Maurice M., 5,065,798, Cl. 140-123.600.

Paneth, Eric: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.

Pankowiak, Christian: *See—*
Bertin, Patrice; and Pankowiak, Christian, 5,065,850, Cl. 192-90.000.

Panten, Detlef; Hertweck, Gernot; and Bender, Franz, to Mercedes-Benz AG. Actuating device for a throttle valve arranged in an intake pipe of a diesel internal combustion engine. 5,065,719, Cl. 123-339.000.

Panzera, Carl: *See—*
Forbes Jones, Robin M.; Panzera, Carl; and DeLuca, Robert D., 5,066,225, Cl. 433-8.000.

Panzke, Rolf: *See—*
Kruger, Volker; and Panzke, Rolf, 5,065,826, Cl. 175-75.000.

Papagni, Antonio: *See—*
Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, 5,066,802, Cl. 544-32.000.

Paradise, Carolyn M.; and Bradley, Edward C., to Cetus Corporation. Combination therapy of IL-2 and DTIC for the treatment of melanoma. 5,066,489, Cl. 424-85.200.

Parham, Michael O. Coin hopper assembly. 5,066,261, Cl. 453-57.000.

Paris, Jean, to Salomon S. A. Rear entry ski boot. 5,065,533, Cl. 36-117.000.

Park, Yong-Bo: *See—*
Kim, Byeong-Yun; Jung, Tae-Sung; and Park, Yong-Bo, 5,067,109, Cl. 365-189.050.

Parker Hannifin Corporation: *See—*
Staples, Peter J., 5,066,049, Cl. 285-80.000.

Parker, Jan M.: *See—*
Howland, Leland L.; Parker, Jan M.; Herrig, Doyle G.; and Swanson, David A., 5,065,587, Cl. 62-131.000.

Parker, Robert: *See—*
Mohebban, Manoochehr; Montoya, Wayne; Parker, Robert; and Siden, Dennis C., 5,066,104, Cl. 359-43.000.

Parsi, Edgardo J.; Sims, Keith J.; Elyanow, Irving D.; and Prato, Thomas A., to Ionics, Incorporated. Introducing and removing ion-exchange and other particulates from an assembled electrodeionization stack. 5,066,375, Cl. 204-182.400.

Parsons, Ralph G. W.: *See—*
Ashpitel, William G.; and Parsons, Ralph G. W., 5,065,631, Cl. 73-849.000.

Partis, Richard A.: *See—*
Mueller, Richard A.; and Partis, Richard A., 5,066,679, Cl. 514-618.000.

Partlow, Richard L.: *See—*
Reich, Gary J.; and Partlow, Richard L., 5,066,724, Cl. 525-227.000.

Paspek, Stephen C.; and Eppig, Christopher P., to Standard Oil Company, The. Extraction of oil from stable oil-water emulsions. 5,066,386, Cl. 208-187.000.

Pasqualoni, Anthony M.; Mahulikar, Deepak; Jalota, Satish K.; and Brock, Andrew J., to Olin Corporation. Process for producing black integrally colored anodized aluminum components. 5,066,368, Cl. 204-58.000.

Pastorek, Emmerich; Orth, Winfried; Weiss, Wolfgang; and Kleffner, Hans W., to Rutgerswerke AG. Novel separation process. 5,066,806, Cl. 546-180.000.

Patel, Kundan M.: *See—*
Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundan M., 5,066,772, Cl. 528-354.000.

Paterson, Raymond: *See—*
Akam, Nigel J.; Cameron, Donald M.; Halliday, David K.; and Paterson, Raymond, 5,065,858, Cl. 198-493.000.

Patrick, James W.; Heinemann, Stephen F.; Boss, Barbara D.; and Cowan, W. Maxwell, to Salk Insstitute for Biological Studies, The. Synthetic peptide-based anti-rabies compositions and methods. 5,066,593, Cl. 435-240.270.

Pattock, Greg R., to Sparton Corporation. Ignition interlock system. 5,065,604, Cl. 70-239.000.

Patzschke, Hans-Peter; and Goebel, Armin, to Herberts GmbH. Aqueous coating material method for its preparation and its use for electrophoretic coating. 5,066,689, Cl. 523-415.000.

Paul, James T., Jr., to Hercules Incorporated. Method of manufacturing carbon fiber using preliminary stretch. 5,066,433, Cl. 264-29.200.

Pawlikowski, Joseph M.: *See—*
Henschen, Homer E.; McKee, Michael J.; and Pawlikowski, Joseph M., 5,065,501, Cl. 29-611.000.

Pazda, Robert J.; Clum, Kenneth L.; and Hood, Harrison P., III, to Eastman Kodak Company. Apparatus and method for measuring lateral charge distribution on a moving web. 5,066,918, Cl. 324-452.000.

PCF Group, Inc.: *See—*
McDonough, Charles M., 5,066,318, Cl. 55-502.000.

Pearce, Robert C.: *See—*
Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., 5,066,482, Cl. 424-45.000.

Pearlstine, Kathryn A.: *See—*
Houle, William A.; Larson, James R.; and Pearlstine, Kathryn A., 5,066,821, Cl. 430-137.000.

Pearson, David B. Speed governor safety device for stopping an elevator car. 5,065,845, Cl. 187-89.000.

Pedersen, Borge C. Diaphragm valve. 5,065,980, Cl. 251-144.000.

Pedersen, Richard C.; and Sedro, Richard M., to Control Data Corporation. Radiation detection and signal delay circuitry for protecting recorded data. 5,067,106, Cl. 395-575.000.

Peiffer, Dennis G., to Exxon Research and Engineering Company. Polymerizable cationic viscoelastic monomer fluids. 5,066,753, Cl. 526-310.000.

Peleg, Shmuel: *See—*
Bergen, James R.; Burt, Peter J.; Hingorani, Rajesh; and Peleg, Shmuel, 5,067,014, Cl. 358-105.000.

Pell, James W., to Diasonics, Inc. Lithotripsy system. 5,065,761, Cl. 128-660.030.

Pelosi, Michael H., III: *See—*
Mitchell, George; and Pelosi, Michael H., III, 5,065,668, Cl. 98-31.500.

Pennebaker, William B.: *See—*
Goldowsky, Michael P.; and Pennebaker, William B., 5,066,512, Cl. 427-14.100.

Peo, Steven D.: *See—*
Takken, Paul E.; Scheckel, Robert G.; and Peo, Steven D., 5,065,469, Cl. 15-89.000.

Pera, John D.; Hickman, Loel L.; and Conoway, Lawrence S., to Buckman Laboratories International, Inc. Fungicidal and corrosion inhibiting paint pigments. 5,066,334, Cl. 106-462.000.

Perepezko, John H.; and Hoffmeyer, Mark K., to Wisconsin Alumni Research Foundation. Method of evaluation and identification for the design of effective inoculation agents. 5,066,324, Cl. 75-335.000.

Perkin-Elmer Corporation, The: *See—*
America, William G.; and Poole, Richard R., 5,066,533, Cl. 428-156.000.

Perko, Jack E.; Wirth, Gary J.; and Foxgrover, Brian A., to W. H. Brady Co. Process for pultruding a composite sign. 5,066,349, Cl. 156-166.000.

Permyakov, Georgy P.: *See—*
Zlobin, Mikhail N.; Metsik, Viktor M.; Nemarov, Alexandr A.; Permyakov, Georgy P.; and Taraban, Nikolai T., 5,066,389, Cl. 209-170.000.

Perri, Joseph A., to Insul Company, Inc. Automatic gas hookup to a ladle. 5,065,986, Cl. 266-217.000.

Persing, Brian J.: *See—*
DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.

Person, Carl E. Portable electronic navigation aid. 5,067,081, Cl. 364-444.000.

Perzan, Denis A.: *See—*
Markowski, Robert G.; Perzan, Denis A.; Morby, John A.; and Robarge, Dean A., 5,067,043, Cl. 361-361.000.

Perzl, Peter R.; Ruberg, Wolfgang; and Puell, Heinz B., to Haraeus Holding GmbH. Gas laser apparatus. 5,067,135, Cl. 372-83.000.

Peters, Donald C.; and Seely, Richard L., to Corning Incorporated. Extrusion die for forming thin-walled honeycomb structures. 5,066,215, Cl. 425-464.000.

Peterson, David A.: *See—*
Albers, Stephen J.; Grimshaw, Michael N.; Peterson, David A.; Pugh, John H.; and Wisbey, Jerry D., 5,066,352, Cl. 156-265.000.

Peterson, Kenneth D. Dado lathe. 5,065,802, Cl. 144-2.00R.

Peterson, Kenneth S.: *See—*
Harkrader, Ronald J.; Jones, Richard R.; and Peterson, Kenneth S., 5,066,483, Cl. 424-54.000.

Peterson, William M.; Anderson, Howard C.; Leivian, Robert; and Garrison, Sidney C., to Motorola Inc. SPANN: Sequence processing artificial neural network. 5,067,095, Cl. 395-24.000.

Petrillo, Richard J.; and O'Connor, William T., to Gillette Company, The. Writing instrument cap. 5,066,156, Cl. 401-213.000.

Pettersson, Sven-Olov: *See—*
Lundberg, Per-Olof; and Pettersson, Sven-Olov, 5,066,251, Cl. 439-701.000.

Pettijohn, Ted M.; and Hsieh, Henry L., to Phillips Petroleum Company. Olefin polymerization with cyclopentadienyl lanthanidealkyl of hydride in presence of hydrogen. 5,066,739, Cl. 526-127.000.

Peuckert, Marcellus: *See—*
Gerdau, Thomas; Kleiner, Hans-Jerg; Peuckert, Marcellus; Bruck, Martin; and Aldinger, Fritz, 5,066,623, Cl. 501-97.000.

Peuterbaugh, Bruce G., to J. P. Tool, Inc. Draw bar adapter structure for and method of securing a tool to a spindle. 5,066,178, Cl. 409-233.000.

Pfeifer, Gerhard, to Wild Leitz GmbH. Automatic locking mechanism for the drive device of a microtome. 5,065,657, Cl. 83-703.000.

Pfizer Hopsital Products Group, Inc.: *See—*
Chapman, Michael W.; Mears, Dana C.; and Edwards, Charles C., 5,066,296, Cl. 606-64.000.

Pfizer Inc.: *See—*
Lipinski, Christopher A., 5,066,659, Cl. 514-278.000.

Philip Morris Inc.: *See—*
Tomanovits, John, 5,066,270, Cl. 493-435.000.

Philipp, Warren H., to United States of America, National Aeronautics and Space Administration. Method of making contamination-free ceramic bodies. 5,066,625, Cl. 501-127.000.

Phillips Petroleum Company: *See—*
Fodor, Lawrence M.; and Willcox, Kenneth W., 5,066,686, Cl. 523-102.000.
Geibel, Jon F.; Bobsein, Rex L.; and Yelton, Harold D., 5,066,774, Cl. 528-388.000.
Pettijohn, Ted M.; and Hsieh, Henry L., 5,066,739, Cl. 526-127.000.
Willcox, Kenneth W., 5,066,460, Cl. 422-7.000.

Phillips, Ronald W., II, to B. F. Goodrich Company, The. Method for making a blind fastener. 5,066,446, Cl. 264-242.000.

Phoenix Environmental, Ltd.: *See—*
Cheetham, Eric, 5,065,680, Cl. 110-342.000.

Pickett, David A.: *See—*
Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, 5,066,038, Cl. 200-737.000.

Piersol, Allan G.: *See—*
Hodges, Hency C., Sr.; Hodges, Henry C., Jr.; Ashmore, Sam C.; and Piersol, Allan G., 5,065,618, Cl. 73-146.000.

Pignard, Guy: *See—*
Bardin, Christian; Pignard, Guy; Boulet, Jean; and Morin, Pierre, 5,065,825, Cl. 175-38.000.

Pinchott, Gordon A., to Sundstrand Corporation. Rotating rectifier assembly. 5,065,484, Cl. 29-25.020.

Pingston, Mark. Ball dispensing machine. 5,066,010, Cl. 273-26.00D.

Pinney, Richard C. Framework for cabinet structure. 5,066,161, Cl. 403-172.000.

Pino, Giovanni; Scherer, Thomas W.; and Stephens, Ruth A., to Threeco. Vented beverage can cover having pivotal spout. 5,065,909, Cl. 222-484.000.

Pioneer Electronic Corporation: *See—*
Ishida, Kohji; Nishimura, Yasushi; and Yamaguchi, Shigeru, 5,067,157, Cl. 381-13.000.
Yoshida, Masayuki; Yoshio, Junichi; and Watanabe, Osamu, 5,067,119, Cl. 369-47.000.

Pipella, Michael: *See—*
Liston, Jack L.; Pipella, Michael; and Bathemes, Pete, 5,066,405, Cl. 210-693.000.

Pirelli General plc: *See—*
Emery, Kenneth R.; Bennett, Harold R.; and Clark, Jack, 5,066,516, Cl. 427-118.000.

Pirl, William E., to Westinghouse Electric Corp. System and method for laser welding the inner surface of heat exchanger tubes. 5,066,846, Cl. 219-121.630.

Pitzer, Ulrike; Franz, Gerhard; and Laubach, Benno, to Bayer Aktiengesellschaft. Silicon nitride powders of low isoelectric point and processes for their production. 5,066,473, Cl. 423-344.000.

Plaskett, John R.: *See—*
Center, John L.; Mills, William C., Jr.; and Plaskett, John R., 5,066,269, Cl. 493-183.000.

Plasta Fiber Industries, Inc.: *See—*
Miller, Douglas C., 5,066,061, Cl. 296-97.100.

Plath, Hans-Heinrich: *See—*
Ostermann, Friedrich; Plath, Hans-Heinrich; and Griep, Winfried, 5,065,510, Cl. 29-894.324.

Plochocka, Krystyna: *See—*
Helioff, Michael W.; Plochocka, Krystyna; and Tazi, Mohammed, 5,066,481, Cl. 424-47.000.

Pluveau, Raymond: *See—*
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Pochopien, Kevin P.: *See—*
Claar, Terry D.; Schiroky, Gerhard H.; and Pochopien, Kevin P., 5,066,622, Cl. 501-87.000.

Podell, Allen F.: *See—*
Ramachandran, Ravi; and Podell, Allen F., 5,066,926, Cl. 330-311.000.

Point, Jacques; and Joulia, Pierre, to Rena S.A. Diaphragm pump. 5,066,204, Cl. 417-413.000.

Polak, Comer F. Cord caddie. 5,065,964, Cl. 248-51.000.

Polaroid Corporation: *See—*
Mailloux, Dennis R.; Smith, Harry A.; and Kelly, Neal F., 5,066,047, Cl. 283-86.000.

Poli Industria Chimca S. p. A.: *See—*
Moro, Luigi; Fiori, Achille; and Natali, Alberto, 5,066,495, Cl. 424-451.000.

Poli Industria Chimica S.p.A.: *See—*
Poli, Stefano; Coppi, Germano; and Del Corona, Lucio, 5,066,644, Cl. 514-19.000.

Poli, Stefano; Coppi, Germano; and Del Corona, Lucio, to Poli Industria Chimica S.p.A. Derivatives of thiazolidine-4-carboxylic acid, its preparation and pharmaceutical compositions containing it. 5,066,644, Cl. 514-19.000.

Polski, Stephen P., to Minnesota Mining and Manufacturing Company. Release treated non-woven fastening tape protector. 5,066,289, Cl. 604-389.000.

Polster, Walter: *See—*
Ifflaender, Helmut; Matura, Eike; Polster, Walter; and Rattner, Manfred, 5,065,762, Cl. 128-660.030.

Polyonics Corporation: *See—*
Walsh, Daniel R., 5,066,545, Cl. 428-626.000.

Ponticello, Ignazio S.: *See—*
Osterhoudt, Hans W.; Ponticello, Ignazio S.; Christy, Kenneth G., Jr.; Bowman, Wayne A.; and Eikenberry, Jon N., 5,066,376, Cl. 204-182.800.

Poole, Richard R.: *See—*
America, William G.; and Poole, Richard R., 5,066,533, Cl. 428-156.000.

Porzio, Linda A.: *See—*
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.

Potter, George S.: *See—*
Wofford, Ray F.; and Potter, George S., 5,066,165, Cl. 405-119.000.

Potter, William S., Jr. Striking rod holder. 5,065,540, Cl. 43-21.200.

Powell, James W.; Voss, Mark G.; and Waineo, Bryan N., to Williams International Corporation. Refrigeration system with high speed, high frequency compressor motor. 5,065,590, Cl. 62-175.000.

Powell, Jonathan S. Means and method to treat swimming pool water. 5,066,408, Cl. 210-765.000.

Powell, Robert C. Internal combustion engine and kit therefore. 5,065,704, Cl. 123-25.00J.

Pozzi, Bruno. Dental tooth shade matching system. 5,066,227, Cl. 433-26.000.

Pozzobon, Alessandro; and Gorza, Roberto, to Nordica S.p.A. Closure device, particularly for ski boots. 5,065,530, Cl. 36-50.000.

PPG Industries, Inc.: *See*—
Gemert, Barry V.; and Bergomi, Maria P., 5,066,818, Cl. 549-389.000.
Martz, Jonathan T.; Kelly, Thomas W.; Dowbenko, Rostyslaw; Meier, James A.; and Palermo, Anthony C., 5,066,733, Cl. 525-455.000.
Singleton, David E.; Ho, Kuo-Chuan; and Greenberg, Charles B., 5,066,111, Cl. 359-275.000.

Prager, Bernhard C., to Biochemie Gesellschaft m.b.H. Crystalline cephalosporin derivative. 5,066,798, Cl. 540-225.000.

Prato, Thomas A.: *See*—
Parsi, Edgardo J.; Sims, Keith J.; Elyanow, Irving D.; and Prato, Thomas A., 5,066,375, Cl. 204-182.400.

Pratt, Charles R.: *See*—
Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.

Pratt, John D., to MAG Aerospace Industries, Inc. Blind fastener. 5,066,179, Cl. 411-34.000.

Prestridge, Patrick L. Attachment device for providing detachable uppers in footwear and the like. 5,065,531, Cl. 36-100.000.

Prickett, Robert B. Decorative exterior trim lighting system. 5,067,061, Cl. 362-145.000.

Procter & Gamble Co., The: *See*—
Chang, Nienyuan J., 5,066,414, Cl. 252-8.800.
Ehrman, Albert M.; Seiden, Paul; Weitzel, Rose M.; and White, Robert L., 5,066,510, Cl. 426-607.000.
Ofosu-Asante, Kofi; and Stephans, Scott E., 5,066,425, Cl. 252-546.000.
Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., 5,066,419, Cl. 252-174.110.

Progressive Angioplasty Systems, Inc.: *See*—
Hess, Robert L., 5,066,298, Cl. 606-194.000.

Prohs, John R.: *See*—
Schneid, Michael R.; and Prohs, John R., 5,067,149, Cl. 379-224.000.

Propper Manufacturing Company, Inc.: *See*—
Augurt, Thomas A., 5,066,464, Cl. 422-58.000.

Protasi, Otello; and Rappuoli, Paolo, to Sclavo, S.p.A. Method for the purification of interferon. 5,066,786, Cl. 530-351.000.

Protein Technology, Inc.: *See*—
Stott, Gerald H.; and Lucas, David O., 5,066,491, Cl. 424-85.800.

Przybylowicz, Catherine S.; Brill, Edwin W., Jr.; and Carrozziere, Luigi A., to Eastman Kodak Company. Reference reading in an analyzer. 5,067,093, Cl. 364-498.000.

Puckett, Paul M.: *See*—
Hefner, Robert E., Jr.; Puckett, Paul M.; and Earls, Jimmy D., 5,066,750, Cl. 526-273.000.

Puell, Heinz B.: *See*—
Perzl, Peter R.; Ruberg, Wolfgang; and Puell, Heinz B., 5,067,135, Cl. 372-83.000.

Pugel, Thomas: *See*—
Agarwal, Pawan K.; and Pugel, Thomas, 5,066,694, Cl. 524-60.000.

Pugh, John H.: *See*—
Albers, Stephen J.; Grimshaw, Michael N.; Peterson, David A.; Pugh, John H.; and Wisbey, Jerry D., 5,066,352, Cl. 156-265.000.

Punt, Harvard A. Neck holding device for livestock. 5,065,701, Cl. 119-147.100.

Pusnes A/S: *See*—
Krogstad, Ivar, 5,065,689, Cl. 114-230.000.

Putnam, Alan R.; Mishra, Saroj K.; and Nair, Muraleedharan G., to Board of Trustees Operating Michigan State University. Method of inhibiting fungus using novel antifungal compounds. 5,066,585, Cl. 424-121.000.

QNC, Inc.: *See*—
Darvin, Richard M., 5,066,851, Cl. 219-400.000.

Quantin, Daniele; and Galdon, Francisco, to Institut Recherches de la Siderurgie Francais - IRSID. Protective coated iron and steel products. 5,066,548, Cl. 428-629.000.

Quate, Calvin F.; and Tortonese, Marco, to Leland Stanford Juninor University, Board of Trustees of the. Nitride cantilevers with single crystal silicon tips. 5,066,358, Cl. 156-647.000.

Questech Limited: *See*—
Billing, Robert, 5,067,133, Cl. 371-53.000.

Quinn, Daniel M., to University of Iowa Research Foundation. Carbamate inhibitors of cholesterol esterase and their use as hypolipidemic and hypocaloric agents. 5,066,674, Cl. 514-529.000.

R. G. Hansen & Associates: *See*—
Hansen, Robert G., 5,066,166, Cl. 405-128.000.

R. J. Reynolds Tobacco Company: *See*—
Fagg, Barry S., 5,065,775, Cl. 131-297.000.
Grubbs, Robert E.; Haberkern, Richard G.; Edwards, Michael E.; and Frederickson, James D., 5,065,774, Cl. 131-291.000.
Lawson, Jerry W.; and Casey, William J., III, 5,065,776, Cl. 131-365.000.

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Stonebraker, Richard L.; and Lasley, James, 5,066,182, Cl. 412-3.000.
Tapper, Lee C., 5,065,675, Cl. 101-153.000.

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Castrigno, Steven; Rafferty, Scott E.; Nichols, Lawrence R.; and Bemis, Claude, 5,066,037, Cl. 280-732.000.

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Protasi, Otello; and Rappuoli, Paolo, 5,066,786, Cl. 530-351.000.

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Schuster, Rudolf; and Raschke, Josef, 5,066,844, Cl. 219-85.160.

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Mohebban, Manoochehr; Montoya, Wayne; Parker, Robert; and Siden, Dennis C., 5,066,104, Cl. 359-43.000.

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New, David A., 5,066,887, Cl. 313-414.000.

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Byczynski, Dean G.; and Reed, William A., 5,065,584, Cl. 62-81.000.

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Cooksey, Andrew G.; and Reesing, David L., 5,066,060, Cl. 294-86.180.

Reeves, Peter R.: *See*—
Manning, Paul A.; Reeves, Peter R.; and Rowley, Derrick, 5,066,596, Cl. 435-252.330.

Regnir, Gilbert; Dhainaut, Alain; Lepagnol, Jean; and Lepagnol, Jean, to Adir et Compagnie. Pyrrolidone compounds for treating cerebral disorders. 5,066,651, Cl. 514-235.500.

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Hopperdietzel, Siegfried, 5,065,808, Cl. 160-231.200.

Reich, Gary J.; and Partlow, Richard L., to Rexene Products Company. Novel film compositions. 5,066,724, Cl. 525-227.000.

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Reid, Robert A.: *See*—
Goodnow, Ronald F.; and Reid, Robert A., 5,066,364, Cl. 162-281.000.
Reiner, Richard A.: *See*—
Clarey, Robert J.; and Reiner, Richard A., 5,066,832, Cl. 174-50.000.
Reinking, Klaus: *See*—
Dorf, Ernst-Ulrich; Reinking, Klaus; Jakob, Wolfgang; Tresper, Erhard; and Russeler, Wolfgang, 5,066,775, Cl. 528-388.000.
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Reisinger, Lothar; Hagg, Dieter; Wenzl, Werner; and Walther, Klaus, to MTU Motoren- Und Turbinen-Union Munchen GmbH. Brush-type seal. 5,066,024, Cl. 277-53.000.
Reiswig, Gary J. Artificial fingernail clipper. 5,065,513, Cl. 30-29.000.
Reiter, Barbara Blair: *See*—
Morsy, Esam M., 5,066,521, Cl. 427-387.000.
Relco, Inc.: *See*—
Ferdows, Houshang, 5,066,067, Cl. 296-197.000.
Rena S.A.: *See*—
Point, Jacques; and Joulia, Pierre, 5,066,204, Cl. 417-413.000.
Renaud, J. Maurice. Pencil support for security hat. 5,066,154, Cl. 401-131.000.
Reponty, Andre , to Heidelberger Druckmaschinen AG. Accumulator cylinder assembly for a folding machine of a printing press. 5,065,993, Cl. 270-49.000.
Respiratory Support Products, Inc.: *See*—
Beran, Anthony V., 5,066,140, Cl. 374-134.000.
Restall, James E., deceased: *See*—
Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.
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Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.
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Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, 5,066,427, Cl. 260-413.000.
Reuber, Gerhard: *See*—
Dangl, Wolfgang; Schick, Gerald; Nowack, Reinhard; and Reuber, Gerhard, 5,066,040, Cl. 280-756.000.
Reutelingsperger, Christian M., to Boehringer Ingelheim International GmbH. Blood coagulation inhibiting proteins, processes for preparing them and their uses. 5,066,788, Cl. 530-381.000.
Reutelingsperger, Christian P. M., to Boehringer Ingelheim International GmbH. Blood coagulation inhibiting proteins, processes for preparing them and their uses. 5,066,787, Cl. 530-380.000.
Reuter, Peter A. Flow line weighing device. 5,065,632, Cl. 73-861.730.
Revesz, Robert N., to CEM Corporation. Heat resistant and light weight container for materials to be ashed, and process for manufacture thereof. 5,066,843, Cl. 219-10.55R.
Revlon, Inc.: *See*—
Balavich, Nancy P., 5,065,875, Cl. 215-10.000.
Brieva, Hernando; Jose, Natividad; and Tietjen, Marlene, 5,066,485, Cl. 424-63.000.
Castrogiovanni, Anthony; Sandewicz, Robert W.; and Amato, Steven W., 5,066,484, Cl. 424-61.000.
Kamen, Melvin E.; and Bernstein, Philip, 5,066,486, Cl. 424-63.000.
Rexene Products Company: *See*—
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Rey, Marianne: *See*—
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Reyes, Gregory R., to Genelabs Incorporated. HTLV-I peptide antigen and assay. 5,066,579, Cl. 435-5.000.
Rhodes, Arthur B. Conveyor system with transverse pusher to transfer load carrier between seperate conveying paths. 5,065,678, Cl. 104-88.000.
Rhodes, Keith J.; and Voorheis, Scott D. Magnetic separator with reciprocating grate. 5,066,390, Cl. 209-217.000.
Rhodes, Larry F., to B. F. Goodrich Company, The. Pyridinium metathesis catalysts for cycloolefin polymerization. 5,066,740, Cl. 526-160.000.
Rhone-Poulenc Basic Chemicals Co.: *See*—
Gerard, Thomas W., 5,066,441, Cl. 264-118.000.
Rhone-Poulenc Chimie: *See*—
Arnold, Jean-Claude; Cyprien, Guy; and Olivere, Jean-Francois, 5,066,468, Cl. 422-266.000.
Gubelmann, Michel; Rochin, Christophew; and Allandrieu, Christian, 5,066,827, Cl. 560-163.000.
Morelle, Jean V.; and Lauzanne-Morelle, Eliane, 5,066,487, Cl. 424-68.000.
Schuppiser, Jean-Luc; Coutant, Antoine; and Bozetto, Jean-Claude, 5,066,508, Cl. 426-584.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Chevallier, Yvonick, 5,066,420, Cl. 252-313.200.
Ri, Seigen: *See*—
Ohba, Takayuki; Miyagaki, Shinji; Hara, Tatsushi; Morishita, Kenji; Suzuki, Seiichi; and Ri, Seigen, 5,066,612, Cl. 437-192.000.
Ricardo Group PLC: *See*—
Hundleby, Giles E., 5,065,712, Cl. 123-188.00M.
Lesley, Samuel, 5,065,711, Cl. 123-188.00M.
Rice, Jean E. Breast prosthesis. 5,066,302, Cl. 623-7.000.
Richard Wolf GmbH: *See*—
Belikan, Thomas; and Krauss, Werner, 5,065,742, Cl. 128-24.0EL.
Richards, Douglas, to Otis Elevator Company. Method for installing elevator system components. 5,065,843, Cl. 187-1.00R.
Richland Industrial, Inc.: *See*—
Sullins, Harry P., 5,066,350, Cl. 156-187.000.
Richter, Hans. Flexible guide rail and method for manufacturing same. 5,066,834, Cl. 191-40.000.
Richter, Karl-Heinz; Rollmann, Gerhard; Struck, Helmut; and Eilert, Gerd, to Daimler-Benz AG. Motor vehicle with wheels driven via differential gearing or the like. 5,065,835, Cl. 180-197.000.
Ricoh Company, Ltd.: *See*—
Nishida, Hirobumi, 5,067,165, Cl. 382-19.000.
Yano, Satoshi, 5,067,027, Cl. 358-439.000.
Ridenour, Carlene. Tape dispensing devices. 5,065,925, Cl. 225-78.000.
Riedisser, Gunter; and Braun, Rainer, to L. Schuler Pressen GmbH. Drive arrangement for a male-die-side ejector slidably disposed in a slide of a mechanical metal-forming press. 5,065,636, Cl. 74-40.000.
Riegel, Ulrich: *See*—
Engelhardt, Friedrich; Riegel, Ulrich; Gersdorf, Joachim; and Kleiner, Hans-Jerg, 5,066,745, Cl. 526-240.000.
Rieper, Wolfgang; and Hafner, Otmar, to Hoechst Aktiengesellschaft. Powdered azo pigments with improved rheological properties, process for their preparation and their use. 5,066,687, Cl. 523-205.000.
Riesner, Detlev: *See*—
Rosenbaum, Volker; and Riesner, Detlev, 5,066,377, Cl. 204-182.800.
Rieter Machine Works, Ltd.: *See*—
Eichengerger, Hansulrich; and Clement, Heinz, 5,065,477, Cl. 19-150.000.
Meyer, Urs; Oberhansli, Rene F.; and Hausler, Dominik, 5,066,854, Cl. 250-202.000.
Rifkin, Arnold S.: *See*—
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Riker Laboratories, Inc: *See*—
Rustad, Mark A., 5,066,822, Cl. 558-389.000.
Ringle, Richard P.: *See*—
Larson, Richard I.; Ringle, Richard P.; and Harmon, John L., 5,066,429, Cl. 264-0.500.
Rinkewich, Isaac. Self-propelled vehicle. 5,066,031, Cl. 280-221.000.
Rioja, Roberto J.; Bowers, Joel A.; and James, R. Steve, to Aluminum Company of America. Aluminum-lithium alloys and method of making the same. 5,066,342, Cl. 148-12.70A.
Rippel, Harald, to Erwin Kayser - Threde GmbH. Reflector system for michelson interferometers. 5,066,990, Cl. 356-346.000.
Ritter, Karl M., to Container Corporation of America. Container with end wall opening for handle access. 5,065,937, Cl. 229-117.130.
Ritzer, Christian: *See*—
Fischer, Florian; and Ritzer, Christian, 5,066,267, Cl. 475-168.000.
Rivera, Roberto S. Electronic voice and control system for billiards. 5,066,008, Cl. 273-2.000.
Rivoli, Anthony L.: *See*—
Young, William R.; and Rivoli, Anthony L., 5,066,995, Cl. 357-42.000.
Roach, Ernest F.; Frick, Stephen D.; and Sample, Randell F., to Draper Corporation. Loom temple control system to vary pick density. 5,065,796, Cl. 139-300.000.
Robache, Patrick, to Mecaplastic. Packaging machine for closing packaging trays or the like after filling, by welding a film of thermoplastic material. 5,065,563, Cl. 53-69.000.
Robarge, Dean A.: *See*—
Markowski, Robert G.; Perzan, Denis A.; Morby, John A.; and Robarge, Dean A., 5,067,043, Cl. 361-361.000.
Robert Bosch GmbH: *See*—
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Klenk, Martin, 5,065,726, Cl. 123-480.000.
Krauter, Immanuel; and Klotzner, Winfried, 5,065,729, Cl. 123-643.000.
Spoetter, Detlef, 5,065,725, Cl. 123-463.000.
Roberts, Bradley M.: *See*—
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Robertson-CECO Corporation: *See*—
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Robertson, Malcolm A., to Australian Wire Industries Pty. Limited. Jet wiping nozzle. 5,066,519, Cl. 429-349.000.
Robey, Frank A.; Fields, Raymond L.; and Lindner, Wolfgang, to United States of America, Health and Human Services. Synthesis of chloroacetyl and bromoacetyl modified peptides for the preparation of synthetic peptide polymers, conjugated peptides, and cyclic peptides. 5,066,716, Cl. 525-54.100.
Robichaux, Bradley A.: *See*—
Bourgeois, Norman R.; and Robichaux, Bradley A., 5,065,735, Cl. 126-40.000.
Robinette, Susan; Lynch, Anita P.; Hoffend, Thomas R.; Grabowski, Edward F.; and Carmichael, Kathleen M., to Xerox Corporation. Styrene butadiene copolymers as binders in mixed pigment generating layer. 5,066,557, Cl. 430-58.000.

Robson, David: *See—*
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Rocazella, Michael A.: *See—*
Kantner, Robert C.; Rocazella, Michael A.; Weinstein, Jerry G.; and Waite, Danny R., 5,066,618, Cl. 501-127.000.

Rochin, Christophew: *See—*
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Rockar, James A.: *See—*
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Rockefeller University, The: *See—*
Kappas, Attallah; and Drummond, George S., 5,066,650, Cl. 514-185.000.

Rocklitz, Gary J.; Crofoot, Douglas G.; and Zelinka, Richard L., to Donaldson Company, Inc. Self-spaced pleated filter. 5,066,400, Cl. 210-493.500.

Rockwell International Corporation: *See—*
Adams, William J.; Jex Courter, Barbara G.; Fong, Craig S.; Murray, Robert C.; and Marshall, Paul A., 5,065,962, Cl. 244-234.000.
Culp, Gordon W., 5,066,084, Cl. 359-213.000.

Rode, Klaus: *See—*
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Rodel, Gunther: *See—*
Tamm, Rolf; Rodel, Gunther; and Stengele, Erich, 5,066,123, Cl. 356-312.000.

Roess, Rudi: *See—*
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Rogers, Fulton F., Jr.: *See—*
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Rogers, Michael D. G.; and Henderson, William B., to Geochemical Services, Inc. Electrothermal direct injection torch for inductively coupled plasma. 5,066,125, Cl. 356-316.000.

Rogerson, William E.: *See—*
Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, 5,066,038, Cl. 200-737.000.

Rohm GmbH Chemische Fabrik: *See—*
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Siol, Werner; and Terbrack, Ulrich, 5,066,718, Cl. 525-84.000.

Rohm and Haas Company: *See—*
Bortnick, Newman M.; Wanat, Robert A.; and Degraff, Darnel, 5,066,696, Cl. 524-91.000.
Koller, Robert D., Sr.; and Hemenway, Carl P., 5,066,708, Cl. 524-504.000.
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Rohr Industries, Inc.: *See—*
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Rohr, Robert D.; and Kitterman, Lawrence R., to Seaquist Closures. Two-piece dispensing closure with cantilevered biasing member. 5,065,911, Cl. 222-517.000.

Roll Systems, Inc.: *See—*
Crowley, H. W., 5,065,992, Cl. 270-39.000.

Rollmann, Gerhard: *See—*
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Romankiw, Lubomyr T.: *See—*
Andreshak, Joseph C.; Datta, Madhav; Romankiw, Lubomyr T.; and Vega, Luis F., 5,066,370, Cl. 204-129.100.

Romano, Antonio, to Campagnolo Srl. Gear for bicycles and a freewheel for bicycles including a plurality of such gears. 5,066,264, Cl. 474-152.000.

Romano, James J.: *See—*
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,065,466, Cl. 5-453.000.

Romano, Raymond. Handicap-accessible restroom. 5,065,462, Cl. 4-604.000.

Roobeek, Cornelis F.: *See—*
Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., 5,066,777, Cl. 528-392.000.

Roos, Uwe-Volker; and Gittner, Franz, to Bekum Maschinenfabriken GmbH. Method and apparatus for heating and conveying plastic preforms prior to mold blowing operations. 5,066,222, Cl. 432-5.000.

Rope, Eugene L.; Stewart, Dary R.; Tricoles, Gus P.; Vance, Gary L.; Roussos, Jonathan; and Luoma, Roy S., to General Dynamics, Electronics Division. Radome diagnostic system. 5,066,921, Cl. 324-639.000.

Rorden, Louis H., to Develco, Inc. Correlation for combinational coded telemetry. 5,067,114, Cl. 367-81.000.

Rosati, Robert J.: *See—*
DeFrank, Michael P.; and Rosati, Robert J., 5,066,142, Cl. 374-208.000.

Rosby Corporation: *See—*
Yurgevich, Howard J.; and Navoczynski, Stanley J., 5,066,066, Cl. 296-181.000.

Rosch, Wilhelm. Hinged multiple garment hanger. 5,065,915, Cl. 223-89.000.

Roscher, Gunter; Schmidt, Karl-Heinz; Eichler, Klaus; Horstermann, Peter; Gradl, Reinhard; and Langner, Horst, to Hoechst Aktiengesellschaft. Process for the isolation of vinyl acetate by distillation. 5,066,365, Cl. 203-042.000.

Rose, Friedhelm: *See—*
Altmann, Joachim; Rose, Friedhelm; Schwartz, Roman; and Schmitt, Horst, 5,065,878, Cl. 220-3.800.

Rose, James: *See—*
Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, 5,066,038, Cl. 200-737.000.

Rosemount GmbH & Co.: *See—*
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Rosenbaum, Volker; and Riesner, Detlev, to Diagen Institute fur molekularbiologische Diagnostik GmbH. Method and device for producing a controllable and reproducible temperature gradient and use thereof. 5,066,377, Cl. 204-182.800.

Rosenthal, Karl-Heinz, to Bielsteiner Verschlusstechnik GmbH. Biased swivel closure. 5,065,912, Cl. 222-517.000.

Rosenthal, Manfred: *See—*
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Ross, Lena. Process and apparatus for disengaging and separating bitumen from pulverized tar sands using selective cohesion. 5,066,388, Cl. 209-170.000.

Rosselet, Ernest: *See—*
Kudelski, Stefan; Schlup, Jean-Claude; and Rosselet, Ernest, 5,067,035, Cl. 360-85.000.

Rossier, Glenn E.: *See—*
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Roth, Andreas: *See—*
Flanhardt, Michael; Roth, Andreas; and Nienhaus, Clemens, 5,065,639, Cl. 74-417.000.

Rouquette, Robert E.: *See—*
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Roussos, Jonathan: *See—*
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Rouzioux, Christine: *See—*
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Rowley, Derrick: *See—*
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Rozenblatt, Mike M., to Monogram Sanitation, a division of MAG Aerospace Industries, Inc. Flow control valve. 5,065,786, Cl. 137-202.000.

Ruberg, Wolfgang: *See—*
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Rubin, Meryl S. A.: *See—*
Szabo, Sandor; Rubin, Meryl S. A.; Klibaner, Michael; and Kamarei, Ahmed R., 5,066,496, Cl. 424-570.000.

Ruby, Kenneth: *See—*
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Rudolph, Leroy, Jr.; and Brimeyer, Dennis A., to Deere & Company. Process for fabricating a moldboard blade. 5,065,646, Cl. 76-101.100.

Rudolph, Robin R.: *See—*
Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., 5,066,482, Cl. 424-45.000.

Ruegg, Walter: *See—*
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Ruff, Klaus; Falk, Bernhard; and Gratz, Werner, to Huels Aktiengesellschaft. Method for processing the residues of a chlorosilane distillation. 5,066,472, Cl. 423-342.000.

Ruhl, Juergen: *See—*
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Martinez, Robert J.; and Rye, Robert R., 5,066,565, Cl. 430-296.000.

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Kadokura, Hidekimi; and Saegusa, Kunio, 5,066,530, Cl. 428-98.000.

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Slay, Clyde E., 5,065,983, Cl. 254-8.00B.

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Coleman, Charles M.; and Kendrick, William G., Sr., 5,065,768, Cl. 128-760.000.

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Noguchi, Takehiko; Sakubata, Takashi; and Nagano, Hirosaku, 5,066,770, Cl. 528-353.000.

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Paris, Jean, 5,065,533, Cl. 36-117.000.

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Kweon, Jung M., 5,066,601, Cl. 436-64.000.

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Roach, Ernest F.; Frick, Stephen D.; and Sample, Randell F., 5,065,796, Cl. 139-300.000.

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Juday, Richard D.; and Sampsell, Jeffrey B., 5,067,019, Cl. 358-160.000.

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Choi, Jung-Hyuk, 5,067,001, Cl. 357-54.000.
Kim, Eun J., 5,067,023, Cl. 358-261.100.
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Hanson, William J.; and Sanders, J. Randolph, 5,066,517, Cl. 427-197.000.

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Abeles, Robert H.; and Gelb, Michael H., 5,066,643, Cl. 514-18.000.
Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., 5,066,482, Cl. 424-45.000.

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Long, Michael; Huttemann, Lyndon R.; Sanford, Robert W.; and Longboat, Robert D., 5,066,345, Cl. 156-157.000.
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Harrold, William J.; Sansone, Joseph A.; Bonfiglio, Joseph W.; and Kim, Seung K., 5,066,891, Cl. 315-8.000.

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Demirel, Osman S.; and Sanwick, John D., 5,066,943, Cl. 340-573.000.

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Iwamoto, Masayuki; Minami, Kouji; and Yamaoki, Toshihiko, 5,066,340, Cl. 136-258.000.
Takano, Yoshiaki; Sato, Koichi; and Shimose, Yutaka, 5,065,592, Cl. 62-180.000.

Sanz, Antonio H.: *See*—
Serrano, Martin S.; and Sanz, Antonio H., 5,065,854, Cl. 192-8.00R.

Sardana, Sanjeev, to Nynex Corporation. Method and apparatus for planning telephone facilities networks. 5,067,148, Cl. 379-111.000.

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Sarraf, Sanwal P., to Eastman Kodak Company. Laser thermal printer having a light source produced from combined beams. 5,066,962, Cl. 346-76.00L.

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Komatsu, Yu; Fujiki, Yoshinori; and Sasaki, Takayoshi, 5,066,404, Cl. 210-670.000.

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Matsuoka, Toshio; Higashida, Akio; and Satake, Tokuki, 5,065,833, Cl. 180-117.000.

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Sekine, Shuji; Furuya, Takeo; and Sato, Katsuhiro, 5,066,878, Cl. 310-68.00C.

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Takano, Yoshiaki; Sato, Koichi; and Shimose, Yutaka, 5,065,592, Cl. 62-180.000.

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Yamamoto, Masato; Koshino, Susumu; Yamanaka, Toshimasa; Sato, Koji; Arai, Akihiro; and Koinuma, Masahiro, 5,066,967, Cl. 354-149.110.

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Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.

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Yoneda, Kou; and Sawada, Takeshi, 5,065,500, Cl. 29-603.000.

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Reese, D. Dwaine; Sawyer, Roy D.; and Crow, Stanley G., 5,066,199, Cl. 417-63.000.

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Baasner, Bernd; Beck, Gunther; Heitzer, Helmut; and Scaller, Klaus, 5,066,681, Cl. 514-716.000.

Scan Group Limited: *See*—
Fell, Roger, 5,065,624, Cl. 73-290.00V.

Scarlata, Richard F.: *See*—
McGraw, Thomas C.; Van Ryne, Randall E.; Scarlata, Richard F.; and Sze, Cho Y., 5,065,996, Cl. 271-176.000.

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Scaroni, Damiano, 5,065,885, Cl. 220-326.000.

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Muller, Gottfried; and Hipp, Paul, 5,065,669, Cl. 98-40.110.

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Scharf, Jonathan. Method and product for improved glass fiber reinforced and filled thermoplastic and thermosetting resin systems. 5,066,361, Cl. 156-663.000.

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Takken, Paul E.; Scheckel, Robert G.; and Peo, Steven D., 5,065,469, Cl. 15-89.000.

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Buhmann, Ulrich; Joppien, Hartmut; and Baumert, Dietrich, 5,066,675, Cl. 514-544.000.

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Dangl, Wolfgang; Schick, Gerald; Nowack, Reinhard; and Reuber, Gerhard, 5,066,040, Cl. 280-756.000.

Schipper, Paul H.: *See*—
Owen, Hartley; and Schipper, Paul H., 5,066,627, Cl. 502-43.000.

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Claar, Terry D.; Schiroky, Gerhard H.; and Pochopien, Kevin P., 5,066,622, Cl. 501-87.000.

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Hanisch, Ferdinand; and Schleese, Eckard, 5,066,863, Cl. 250-474.100.

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Kudelski, Stefan; Schlup, Jean-Claude; and Rosselet, Ernest, 5,067,035, Cl. 360-85.000.

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Eichenauer, Herbert; Wittmann, Dieter; Schmidt, Adolf; and Ott, Karl-Heinz, 5,066,717, Cl. 525-67.000.

Schmidt, Diane G.: *See*—
Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., 5,066,419, Cl. 252-174.110.

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Roscher, Gunter; Schmidt, Karl-Heinz; Eichler, Klaus; Horstermann, Peter; Gradl, Reinhard; and Langner, Horst, 5,066,365, Cl. 203-042.000.

Schmidt, Norman G., to Ford Motor Company. Brake pedal travel warning system. 5,066,940, Cl. 340-453.000.

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David, Helmut; Malik, J. Ernst; and Schmidt, Rainer, 5,065,815, Cl. 165-67.000.

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Borkenhagen, John M.; Schmierer, Quentin; and Geer, Charles P., 5,067,105, Cl. 395-400.000.

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Schmitt, Wayne I., to American Tourister, Inc. Laundry valet. 5,065,864, Cl. 206-278.000.

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Schnell, Kenneth R.: *See*—
Kesler, Gregory J.; and Schnell, Kenneth R., 5,065,968, Cl. 248-205.100.

Scholten, Henricus P. H.: *See*—
Andre, Olivier L. P.; and Scholten, Henricus P. H., 5,066,763, Cl. 528-92.000.

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Schonborn, Karl-Heinz: *See*—
Muller, Gerhard; Kar, Hasan; Dorschel, Klaus; and Schonborn, Karl-Heinz, 5,066,292, Cl. 606-7.000.

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Frantom, Richard L.; Pickett, David A.; Rogerson, William E.; Rose, James; and Schubert, Robert, 5,066,038, Cl. 200-737.000.

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Lorenz, Hans; Gross, Ing. H.; Schuchmann, Roland; and Haring, Helmut, 5,066,435, Cl. 264-40.500.

Schuh, Robert R.; Terrell, Nancy E.; Kreiseder, Walter J.; and Vogel, Allen J., to Scott Paper Company. Container with hinged cover. 5,065,887, Cl. 220-338.000.

Schule, Gerhard: *See*—
Nuesslein, Karl; Motta, Antonio; and Schule, Gerhard, 5,066,243, Cl. 439-460.000.

Schultheis, Lothar: *See*—
Brandle, Hubert; Schultheis, Lothar; and Ruegg, Walter, 5,066,097, Cl. 385-76.000.

Schultz, Richard A.: *See*—
Detweiler, Charles A.; and Schultz, Richard A., 5,065,979, Cl. 251-129.160.

Schultz, William R., Jr.: *See*—
Elton, Richard K.; and Schultz, William R., Jr., 5,066,881, Cl. 310-213.000.
Elton, Richard K.; and Schultz, William R., Jr., 5,067,046, Cl. 361-220.000.

Schultz, Wolfgang: *See*—
Langowski, Andreas; Schultz, Wolfgang; and Walter, Gerhard, 5,065,524, Cl. 33-544.200.

Schulze, Dale R.; Sherman, Jon A.; and Mereness, W. Michael, to Ethicon, Inc. Surgical stapler with locking means. 5,065,929, Cl. 227-19.000.

Schumacher, William A.: *See*—
Ogletree, Martin L.; Schumacher, William A.; Grover, Gary J.; and Friedhoff, Lawrence T., 5,066,480, Cl. 424-10.000.

Schuppiser, Jean-Luc; Coutant, Antoine; and Bozetto, Jean-Claude, to Rhone- Poulenc Chimie. Homogeneous, storage-stable chocolate milk comestibles and process of making. 5,066,508, Cl. 426-584.000.

Schurter, Rolf: *See*—
Kunz, Walter; Schurter, Rolf; and Nyfeler, Robert, 5,066,661, Cl. 514-361.000.

Schuster, Ludwig: *See*—
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

Schuster, Peter. Hydrostatic line testing and method. 5,065,616, Cl. 73-49.200.

Schuster, Rudolf; and Raschke, Josef, to Siemens Aktiengesellschaft. Soldering device with stirrup electrodes and a suction pipette. 5,066,844, Cl. 219-85.160.

Schwartz, Alexander: *See*—
Ishak, Maher; and Schwartz, Alexander, 5,066,312, Cl. 51-295.000.

Schwartz, Roman: *See*—
Altmann, Joachim; Rose, Friedhelm; Schwartz, Roman; and Schmitt, Horst, 5,065,878, Cl. 220-3.800.

Schwarzpech, Bruno K.: *See*—
Gaffan, Charles; and Schwarzpech, Bruno K., 5,066,173, Cl. 408-59.000.

Schweiger, Thaddeus J., to Square D Company. Output protection scheme for unipolar constant current source. 5,067,045, Cl. 361-56.000.

Schweitzer, Naftali; Bodenheimr, Joseph S.; and David, Gerald B., to Driver Safety Systems Ltd. Traffic safety monitoring apparatus. 5,066,950, Cl. 340-937.000.

Schweizer, Horst, to AEG Olympia Office GmbH. Solenoid plunger magnet and its use as print hammer in a print hammer device. 5,066,980, Cl. 335-255.000.

Schweizerische Gesellschaft fur Tuillindustries, AG: *See*—
Kaufmann, Josef, 5,065,601, Cl. 66-195.000.

Schwenker, John P., to Hyperfine, Inc. Stigmatic imaging with spherical concave diffraction gratings. 5,066,127, Cl. 356-328.000.

Science Ventures, Inc.: *See*—
Laird, Douglas H., 5,066,474, Cl. 423-541.00R.

Sclavo, S.p.A.: *See*—
Protasi, Otello; and Rappuoli, Paolo, 5,066,786, Cl. 530-351.000.

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Schuh, Robert R.; Terrell, Nancy E.; Kreiseder, Walter J.; and Vogel, Allen J., 5,065,887, Cl. 220-338.000.

SDS Biotech K.K.: *See*—
Hayashi, Shunji; Yamanaka, Satoshi; Kawaguchi, Sayoko; Ishii, Teruhiko; Kimata, Toshiya; and Misu, Naoaki, 5,066,657, Cl. 514-269.000.

Se Lab Group, Inc.: *See*—
Cross, David L., 5,065,700, Cl. 119-725.000.

Seaquist Closures: *See*—
Rohr, Robert D.; and Kitterman, Lawrence R., 5,065,911, Cl. 222-517.000.

Seats, William R. Mounting brackets for mounting engine asseccories. 5,065,713, Cl. 123-195.00A.

Secretary of the State for Defence in her Britannic Majesty's Government of United Kingdom, The: *See*—
Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.

Sedelmeier, Gottfried: *See*—
Blaser, Hans-Ulrich; Jalett, Hans-Peter; and Sedelmeier, Gottfried, 5,066,801, Cl. 540-523.000.

Sedro, Richard M.: *See*—
Pedersen, Richard C.; and Sedro, Richard M., 5,067,106, Cl. 395-575.000.

Seely, Richard L.: *See*—
Peters, Donald C.; and Seely, Richard L., 5,066,215, Cl. 425-464.000.

Seeman, Bronslaw, to Schlumberger Technology Corporation. Nuclear spectroscopy method and apparatus for digital pulse height analysis. 5,067,090, Cl. 364-486.000.

Seener, G. Thomas; and Heffner, Joseph H., to Sporlan Valve Company. Thermostatic expansion valve. 5,065,595, Cl. 62-212.000.

Segers, Jacobus C.: *See*—
Asbeck, Lutz S.; and Segers, Jacobus C., 5,066,504, Cl. 426-417.000.

Sehgal, Surendra N.; and Vezina, Claude, to American Home Products Corporation. Rapamycin in treatment of tumors. 5,066,493, Cl. 424-122.000.

Seiden, Paul: *See*—
Ehrman, Albert M.; Seiden, Paul; Weitzel, Rose M.; and White, Robert L., 5,066,510, Cl. 426-607.000.

Seidl, Sigrid; Weinrotter, Klaus; and Simharl, Reinhold, to Lenzing Aktiengesellschaft. Mixed polyimides and process for preparing them. 5,066,760, Cl. 528-51.000.

Seifert, Heinrich, to Siemens Aktiengesellschaft. Dewar vessel for a superconducting magnetometer device. 5,065,582, Cl. 62-45.100.

Seiichiro, Nomoto: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Seiko Electric Components Ltd.: *See*—
Toyosawa, Shinichi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Kawagoe, Takahiro, 5,066,556, Cl. 429-194.000.

Seikoh Giken Co., Ltd.: *See*—
Takahashi, Mitsuo, 5,066,094, Cl. 385-73.000.

Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, to Fanuc Ltd. Composite-figure definition method. 5,067,087, Cl. 364-474.240.

Sekine, Akihiko, to Kabushiki Kaisha Topcon. Optical system in a laser scanning eye fundus camera. 5,066,116, Cl. 351-221.000.

Sekine, Atsushi: *See*—
Nakajima, Masaya; and Sekine, Atsushi, 5,066,113, Cl. 359-649.000.

Sekine, Shuji; Furuya, Takeo; and Sato, Katsuhiro, to Jidosha Denki Kogyo K.K. Small-sized electric motor housing circuit breaker. 5,066,878, Cl. 310-68.00C.

Sekino, Naomi: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Sekiya, Shigenobu: *See*—
Hirabayashi, Kazuo; Oono, Tetsuya; Akiyama, Eitetsu; Ishii, Yukihisa; Sekiya, Shigenobu; and Fujimura, Yuji, 5,065,834, Cl. 180-197.000.

Sekiya, Shin: *See*—
Kakuda, Masayuki; Sekiya, Shin; and Kitora, Yoshihisa, 5,066,206, Cl. 418-55.300.

Sekulovski, Bill G. Fuel tank lock. 5,066,062, Cl. 296-97.220.

Selamoglu, Nur: *See*—
Fischer, Frederick H.; Lee, Kuo-hua; Nagy, William J.; and Selamoglu, Nur, 5,066,998, Cl. 357-51.000.

Semler, John: *See*—
Shibata, Tomoo; Semler, John; and Gaesser, George, 5,066,633, Cl. 503-209.000.

Senshu, Takao: *See*—
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.

Sentovich, Michael F.: *See*—
Gutowski, Timothy G.; Sentovich, Michael F.; and Okine, Richard K., 5,066,442, Cl. 264-154.000.

Seo, Ikuo; Oono, Tooru; and Murakami, Yosinobu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Catalytic process for producing raw material pitch for carbon materials from naphthalene. 5,066,779, Cl. 528-396.000.

Serizawa, Takanobu: *See*—
Nagashima, Seiko; and Serizawa, Takanobu, 5,067,170, Cl. 392-461.000.

Sermatech International, Inc.: *See*—
Mosser, Mark F.; Eddinger, Kevin B.; and Fabiny, William J., 5,066,540, Cl. 428-336.000.

Serrano, Martin S.; and Sanz, Antonio H. Security and regulation mechanism to be used as instantaneous antireturn system in both rotational turns levoturn and dextrotur. 5,065,854, Cl. 192-8.00R.

Servadio, Vittorino: *See*—
Chiesi, Paolo; Servadio, Vittorino; and Razzetti, Roberta, 5,066,652, Cl. 514-235.800.

Sessions, Robert W.; and Carr, Roy D., to Ferris Mfg. Co. Hydrophilic foam compositions. 5,065,752, Cl. 128-156.000.

Setoguchi, Shinro; Tsuruda, Mineo; Kitami, Chiaki; and Yamanaka, Tsutomu, to Yoshitomi Pharmaceutical Industries, Ltd. Processes for preparing optically active 3,4-dihydro-3,4-epoxy-2H-1-benzopyran compounds and intermediates therefor. 5,066,816, Cl. 549-331.000.

Sgourakes, George E.: *See*—
Angelosanto, John P.; and Sgourakes, George E., 5,065,611, Cl. 73-4.00R.

SGS Thomson Microelectronics SA: *See*—
Brisson, Pierre, 5,066,853, Cl. 235-381.000.

Shannon, Timothy L. Shower spray system. 5,065,942, Cl. 239-282.000.

Shapiro-Baruch, Ian, to Carrier Corporation. Air conditioner with dehumidifying mode. 5,065,586, Cl. 62-93.000.

Sharp: *See*—
Deguchi, Katsuyasu; Mizoguchi, Takatoshi; Taminaga, Takayuki; and Fujii, Akiyoshi, 5,066,960, Cl. 346-76.0PH.

Sharp Kabushiki Kaisha: *See*—
Iwamoto, Ken; and Narukawa, Atsushi, 5,065,995, Cl. 271-9.000.
Kiribayashi, Shoji, 5,065,506, Cl. 29-632.000.
Kuratate, Tomoaki; Koden, Mitsuhiro; and Hamada, Hiroshi, 5,066,109, Cl. 359-54.000.
Matsubara, Hiroshi; and Nukii, Takashi, 5,065,505, Cl. 29-830.000.
Miyao, Kouji; and Asano, Hajime, 5,067,070, Cl. 395-146.000.
Mizushima, Shigeaki; Nishimura, Eiichiro; Fukami, Seiji; Hashimoto, Ryuji; Nagatomi, Hisato; Onishi, Michihisa; Miyamoto, Mitunobo; and Mitamura, Shoji, 5,066,110, Cl. 359-54.000.
Nagano, Fumikazu, 5,067,168, Cl. 382-53.000.
Nakanishi, Yasushi; and Fukunaga, Takahiro, 5,066,975, Cl. 355-200.000.
Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, 5,066,381, Cl. 204-298.120.
Ueda, Tetuyuki; and Tsunezawa, Masayoshi, 5,066,897, Cl. 318-135.000.

Shaw, David N., to Carrier Corporation. Refrigeration temperature control system. 5,065,591, Cl. 62-175.000.

Shaw, Howard C. Length measuring and positive drive apparatus. 5,065,527, Cl. 33-734.000.

Shearer, Dane: *See*—
Speiser, Robert D.; Bernstein, Steven; Miller, Charles N.; and Shearer, Dane, 5,065,549, Cl. 51-288.000.

Shehan, Billy C.; Shehan, Billy C., Jr.; and Stubbeman, Thomas R. Swimming pool and cover. 5,065,461, Cl. 4-503.000.

Shehan, Billy C., Jr.: *See*—
Shehan, Billy C.; Shehan, Billy C., Jr.; and Stubbeman, Thomas R., 5,065,461, Cl. 4-503.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Mulder, Jan P., 5,066,323, Cl. 75-305.000.

Shell Material Handling Systems, Inc.: *See*—
Shell, Melvin E., 5,066,189, Cl. 414-416.000.

Shell, Melvin E., to Shell Material Handling Systems, Inc. Method and apparatus for handling discrete cargo units. 5,066,189, Cl. 414-416.000.

Shell Oil Company: *See*—
Andre, Olivier L. P.; and Scholten, Henricus P. H., 5,066,763, Cl. 528-92.000.
Fried, Herbert E.; and Johnson, Thomas H., 5,066,829, Cl. 560-217.000.
George, Eric R.; and Slaugh, Lynn H., 5,066,701, Cl. 524-417.000.
Hwo, Charles C., 5,066,543, Cl. 428-412.000.
Job, Robert C., 5,066,737, Cl. 526-119.000.
Modic, Michael J., 5,066,726, Cl. 525-263.000.
Van Deursen, Josephus H.; Van Doorn, Johannes A.; Drent, Eit; and Wong, Pui K., 5,066,778, Cl. 528-392.000.
Van Egmond, Cornelis F. H., 5,065,818, Cl. 166-60.000.
Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., 5,066,777, Cl. 528-392.000.

Shemenski, Robert M.: *See*—
Kim, Dong K.; and Shemenski, Robert M., 5,066,455, Cl. 420-100.000.

Sheng, Zhengzhi; and Hermann, Allen M., to University of Arkansas, The. High temperature superconducting Ti-Ba-Ca-Cu-O phases. 5,066,635, Cl. 505-1.000.

Sheppard, Clyde H.: *See*—
Lubowitz, Hyman R.; Sheppard, Clyde H.; and Stephenson, Ronald R., 5,066,541, Cl. 428-378.000.

Sher, Chen-Hsien. Structure of dust bin. 5,065,886, Cl. 220-331.000.

Sherman, Jon A.: *See*—
Schulze, Dale R.; Sherman, Jon A.; and Mereness, W. Michael, 5,065,929, Cl. 227-19.000.

Sherrington, David C.; and Small, Philip W., to Unilever Patent Holdings B.V. Method for using substrate in peptide synthesis. 5,066,784, Cl. 530-334.000.

Sherrod, Danny G., to Bluff Manufacturing, Inc. Portable dock plate. 5,065,468, Cl. 14-72.500.

Shiba, Tetsuo, to Daiichi Pharmaceutical Co., Ltd. Process for preparing a disaccharide derivative. 5,066,794, Cl. 536-55.300.

Shibahara, Seiji: *See*—
Sato, Yasuo; Kato, Shinsuke; Taniguchi, Takako; Atsumi, Kunio; Hachisu, Mitsugu; and Shibahara, Seiji, 5,066,677, Cl. 514-563.000.

Shibata, Eiji: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,065,804, Cl. 157-13.000.

Shibata, Takeshi: *See*—
Aono, Toshiaki; Nakamura, Koichi; and Shibata, Takeshi, 5,066,563, Cl. 430-213.000.

Shibata, Tomoo; Semler, John; and Gaesser, George, to Graphic Controls Corporation. Sensitizer for heat sensitive paper coatings. 5,066,633, Cl. 503-209.000.

Shibuya, Katsuhiko: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, 5,066,808, Cl. 514-231.500.

Shieh, Gray. Electrical socket. 5,066,238, Cl. 439-139.000.

Shiga, Nobuo, to Sumitomo Electric Industries, Ltd. Semiconductor device. 5,067,006, Cl. 357-74.000.

Shigeto, Negi: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Shih, Sen-Tein. Push-button type controlling-water device. 5,065,982, Cl. 251-320.000.

Shiino, Yutaka: *See*—
Kanagawa, Takashi; Shiino, Yutaka; and Furuyama, Tetsuya, 5,066,976, Cl. 355-200.000.

Shikae, Sadao: *See*—
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.

Shikama, Shinsuke: *See*—
Toide, Eiichi; Shikama, Shinsuke; and Kubota, Masayuki, 5,066,138, Cl. 369-112.000.

Shiley, Robert J., to ITT Corporation. Connector press fit eyelet. 5,066,237, Cl. 439-82.000.

Shim, Hyun J. Method and device for generating electric power by use of wave force. 5,066,867, Cl. 290-53.000.

Shimada, Kazumi; and Chikazawa, Masaaki, to Azuma Tekko Kabushiki Kaisha. Dust discharging apparatus for a furnace. 5,066,186, Cl. 414-221.000.

Shimada, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Counterbalance mechanism for internal combustion engine. 5,065,644, Cl. 74-603.000.

Shimanaka, Chikafumi: *See*—
Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, 5,065,507, Cl. 29-888.010.

Shimizu, Fumio; Nishikubo, Yasutoshi; and Naito, Tadaharu, to Kabushiki Kaisha Light Kohki Seisakusho. Reticule device for a fire sighting scope. 5,065,520, Cl. 33-241.000.

Shimizu, Hideo; and Takahashi, Yasuhiro, to Fuji Electric Co., Ltd. Centput stabilizing apparatus for an optical head. 5,067,117, Cl. 369-116.000.

Shimizu, Hiroshi: *See*—
Omata, Satoshi; Shimizu, Hiroshi; and Yamaguchi, Yoko, 5,067,160, Cl. 382-1.000.

Shimizu, Hiroyuki: *See*—
Ito, Kenji; Shimizu, Hiroyuki; and Wakita, Naomasa, 5,066,934, Cl. 333-205.000.

Shimizu, Mitsuru: *See*—
Sakurai, Kiyofumi; Fujii, Syuso; and Shimizu, Mitsuru, 5,066,997, Cl. 357-45.000.

Shimizu, Seiji: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,066,152, Cl. 400-621.000.

Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, to Speedfam Company, Ltd. Surface processing machine for hard disks and the like. 5,065,547, Cl. 51-154.000.

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Shimizu, Toshimitsu: *See*—
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.

Shimokoriyama, Makoto: *See*—
Ishii, Yoshiki; and Shimokoriyama, Makoto, 5,067,010, Cl. 358-13.000.

Shimomura, Takeshi: *See*—
Yamaguchi, Shuichiro; Shimomura, Takeshi; Uchida, Naoto; Katsube, Teruaki; and Oyama, Noboru, 5,066,383, Cl. 204-435.000.

Shimose, Yutaka: *See*—
Takano, Yoshiaki; Sato, Koichi; and Shimose, Yutaka, 5,065,592, Cl. 62-180.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Inoue, Yoshio; Yoshino, Masachika; and Fujiki, Hironao, 5,066,714, Cl. 524-731.000.

Shin, Masaaki: *See*—
Aizawa, Hironori; Shin, Masaaki; and Okubo, Atsuo, 5,066,727, Cl. 525-296.000.

Shinetsu Chemical Industries, Ltd.: *See*—
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.

Shingyoji, Takyuki: *See*—
Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, 5,066,381, Cl. 204-298.120.

Shintake, Seizi: *See*—
Tomioka, Yutaka; Nakanishi, Satoru; Shintake, Seizi; and Yoneda, Hideki, 5,066,333, Cl. 106-400.000.

Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, to Nihon Tokushu Noyaku Seizo K.K. Pyridyl insecticidally active cyano compounds. 5,066,808, Cl. 514-231.500.

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Shirai, Yuuji: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.

Shirato, Ken: *See*—
Honda, Mamoru; and Shirato, Ken, 5,066,192, Cl. 415-112.000.

Shirodkar, Shailaja M.: *See*—
Migdal, Cyril A.; Shirodkar, Shailaja M.; DeRosa, Thomas F.; and Miller, Edward F., 5,066,412, Cl. 252-54.600.

Shitanoki, Kazuaki; Kawaguchi, Masaaki; and Kobayashi, Saburo, to Honda Giken Kogyo Kabushiki Kaisha. Air bag device for protecting a vehicle occupant. 5,066,039, Cl. 280-741.000.

Shopsmith, Inc.: *See*—
Legler, John G.; Bartlett, Robert L.; and Flora, David D., 5,065,652, Cl. 83-168.000.

Shorewood Technologies, Inc.: *See*—
Mancel, James D., 5,065,935, Cl. 229-40.000.

Short, Svetlana Z.: *See*—
Estelle, Lee R.; and Short, Svetlana Z., 5,067,067, Cl. 364-156.000.

Shroot, Braham; Hensby, Christopher; Maignan, Jean; Lang, Gerard; Restle, Serge; and Colin, Michel, to Centre International de Recherches Dermatologiques dite CIRD. Eicosatriynoic acid esters and their application in pharmaceutical and cosmetic practice. 5,066,427, Cl. 260-413.000.

Shum, Victor K.: *See*—
Miller, Jeffrey T.; and Shum, Victor K., 5,066,628, Cl. 502-66.000.

Sibley, Lewis B.; and Kelly, C. Brian, to Tribology Systems, Inc. Solid-lubricated bearing assembly. 5,066,145, Cl. 384-463.000.

Siczek, Aldona A.: *See*—
Siczek, Bernard W.; and Siczek, Aldona A., 5,067,145, Cl. 378-198.000.

Siczek, Bernard W.; and Siczek, Aldona A. Mobile X-ray apparatus. 5,067,145, Cl. 378-198.000.

Siden, Dennis C.: *See*—
Mohebban, Manoochehr; Montoya, Wayne; Parker, Robert; and Siden, Dennis C., 5,066,104, Cl. 359-43.000.

Siegfried, Erwin; and Marti, Peter, to VSL International AG. Prestressed concrete lining in a pressure tunnel. 5,066,167, Cl. 405-150.100.

Siemens Aktiengesellschaft: *See*—
Becker, Bernard, 5,066,221, Cl. 431-280.000.
Brandner, Gerhard; and Hoebel, Peter, 5,066,864, Cl. 250-484.100.
Droegemueller, Karsten; and Klement, Ekkehard, 5,066,092, Cl. 385-33.000.
Gall, Arthur; and Kupfer, Adelbert, 5,067,142, Cl. 378-99.000.
Greil, Andreas; and Bialas, Joachim, 5,066,089, Cl. 385-35.000.
Greil, Andreas; and Taumberger, Franz, 5,066,093, Cl. 385-33.000.
Hirschberg, Jakub; and Svensson, Bengt, 5,066,278, Cl. 604-256.000.
Ifflaender, Helmut; Matura, Eike; Polster, Walter; and Rattner, Manfred, 5,065,762, Cl. 128-660.030.
Klier, Juergen, 5,066,894, Cl. 315-224.000.
Krause, Norbert; Hanke, Wilhelm; and Ruhl, Juergen, 5,065,760, Cl. 128-653.500.
Krausse, Peter, 5,066,096, Cl. 385-58.000.
Martin, Guenter, 5,067,156, Cl. 380-46.000.
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Seifert, Heinrich, 5,065,582, Cl. 62-45.100.
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Omori, Katsuhisa; and Yamashita, Masaya, 5,066,915, Cl. 324-318.000.

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Wiggins, Kregg S.; and Wright, Danny O., 5,065,721, Cl. 123-399.000.

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Levy, Alan B.; Sifniades, Stylianos; Kent, Lloyd C.; and Frollini, Dominick, Jr., 5,066,373, Cl. 204-153.210.

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Jenq, Ching-Shi, 5,067,108, Cl. 365-185.000.

Silver, Scott C., to Genencor International, Inc. Composition of a steeped starched-containing grain and a cellulase enzyme. 5,066,218, Cl. 426-20.000.

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Seidl, Sigrid; Weinrotter, Klaus; and Simharl, Reinhold, 5,066,760, Cl. 528-51.000.

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Howard, James K.; Simmons, Randall G.; and Yogi, Tadashi, 5,066,552, Cl. 428-694.000.

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Reid, Laurie M.; Koster, Archie; and Hunt, Gary D., 5,065,856, Cl. 198-419.300.

Sims, George W. Sling support apparatus. 5,065,919, Cl. 224-257.000.

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Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 5,066,668, Cl. 514-384.000.

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Sivavec, Timothy M.; and McCormick, Sharon J., to General Electric Company. Polyphenylene ether-polyamide compositions from dicarboxylate-capped polyphenylene ethers. 5,066,719, Cl. 525-92.000.

Sjonell, Goran: *See*—
Karppinen, Eino; and Sjonell, Goran, 5,065,877, Cl. 215-239.000.

Skaugen, Borgeir; and Wedel, Gregory L., to Beloit Corporation. Apparatus for drying a web. 5,065,529, Cl. 34-117.000.

Skelton, Clifford W.: *See*—
Skelton, Stuart P.; and Skelton, Clifford W., 5,065,608, Cl. 72-409.000.

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Brandenstein, Manfred; and Olschewski, Armin, 5,066,147, Cl. 384-585.000.

Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., to Glaxo Group Limited. Phenethandamine derivatives and pharmaceutical use thereof. 5,066,678, Cl. 514-597.000.

Skinner, Gordon R. B.; and Buchan, Alexander, to University of Birmingham. Method of treating herpes simplex virus. 5,066,492, Cl. 424-89.000.

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Cheah, Chun-Foong; and Skovmand, Timothy J., 5,066,901, Cl. 323-267.000.

Skrabal, Falko, to AVL AG. Device for the withdrawal and storage of individual fluid fractions lathered at given intervals. 5,066,283, Cl. 604-152.000.

Slaugh, Lynn H.: *See*—
George, Eric R.; and Slaugh, Lynn H., 5,066,701, Cl. 524-417.000.

Slay, Clyde E., to Safe-T-Jack, Inc. Hydraulic power unit for jack system. 5,065,983, Cl. 254-8.00B.
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Jones, Lawrence D.; Frey, Paul T.; Gleason, David D.; Chee, Paula P.; and Slightom, Jerry L., 5,066,587, Cl. 435-172.100.
Slocum, Laurence S., to Emerson Electric Co. Fluid detection system with relay release and relatch function. 5,066,944, Cl. 340-603.000.
Sluma, Heinz-Dieter: *See*—
Muller, Heinz-Joachim; Sluma, Heinz-Dieter; Eberhard, Gunter; Spindler, Ernst; Krauss, Lothar; and Volker, Helmut, 5,066,401, Cl. 210-500.350.
Small, Philip W.: *See*—
Sherrington, David C.; and Small, Philip W., 5,066,784, Cl. 530-334.000.
Small, Rudy E.: *See*—
Harry, John O.; Verhagen, George; and Small, Rudy E., 5,066,379, Cl. 204-279.000.
Smerdel, Stanislav: *See*—
Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, 5,066,642, Cl. 514-18.000.
Smetana, Bruce A.: *See*—
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.
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Smith, Bill, 5,065,731, Cl. 124-44.500.
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Smith, Jay, III; and Fort, Jeffrey W., 5,067,079, Cl. 364-410.000.
Smith, Harry A.: *See*—
Mailloux, Dennis R.; Smith, Harry A.; and Kelly, Neal F., 5,066,047, Cl. 283-86.000.
Smith International, Inc.: *See*—
Meyers, John A.; Drake, David E.; and Witt, Charles W., 5,065,827, Cl. 175-414.000.
Smith, Jay, III; and Fort, Jeffrey W., to Smith Engineering. Interactive audio baseball game. 5,067,079, Cl. 364-410.000.
Smith, John W.; and Chestnut, Benjamin F., to Emhart Industries, Inc. Automobile brake switch assembly. 5,066,838, Cl. 200-61.890.
Smith Kline & French Laboratories Limited: *See*—
Coates, William J., 5,066,653, Cl. 514-242.000.
Smith, Randy L., to Blount, Inc. Cartridge case flash hole finishing tool. 5,066,174, Cl. 408-79.000.
Smith, Robert D. Universal dispensing apparatus for stacked articles. 5,065,897, Cl. 221-130.000.
Smith, Ronald, to Wray-Tech Instruments, Inc. Hydraulic control system for weighing. 5,065,828, Cl. 177-139.000.
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Smith, Scott D. Bow Sling. 5,065,732, Cl. 124-88.000.
Smiths Industries public limited company: *See*—
Davies, Anthony R.; Downward, Steven J.; and Chilvers, David, 5,065,784, Cl. 137-116.000.
Smoorenburg, Arnoldus D. J.: *See*—
Van Der Marel, Cornelis; and Smoorenburg, Arnoldus D. J., 5,066,888, Cl. 313-564.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Scholz, Heinrich; and Guse, Rudolf, 5,065,811, Cl. 164-460.000.
Smyth, John B., Jr.; and Tappon, Ellen R., to Hewlett-Packard Company. Method for making flexible circuit card with laser-contoured vias and machined capacitors. 5,066,357, Cl. 156-643.000.
Sneed, Michael R.: *See*—
Doye, Dennis L.; and Sneed, Michael R., 5,066,249, Cl. 439-585.000.
Societe Atochem: *See*—
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Societe des Ceramiques Techniques: *See*—
Soria, Raymond; Defalque, Corinne; and Gillot, Jacques, 5,066,398, Cl. 210-321.890.
Societe Electronique de la Region Pays de Loire: *See*—
Huerre, Dominique; and Mehu, Jacques, 5,067,022, Cl. 358-248.000.
Soderberg, Paulmer M.; Foss, Kristin K.; Giles, Thomas E.; and Narciso, Ralph A., to Raynet Corporation. Coupler verification test circuit. 5,066,139, Cl. 371-20.100.
Solar Turbines Incorporated: *See*—
Darragh, Charles T., 5,065,816, Cl. 165-125.000.
Soltermann, Roland; Fritzsche, Peter; and Muller, Kurt, to Maschinenfabrik Rieter AG. Adjusting device and adjustable textile fiber carding apparatus. 5,065,637, Cl. 74-99.00R.
Solvay & Cie (Societe Anonyme): *See*—
Destryker, Elise; and Hannecart, Etienne, 5,066,706, Cl. 524-459.000.
Sonigo, Pierre: *See*—
Montagnier, Luc; Chamaret, Solange; Guetard, Denise; Alizon, Marc; Clavel, Francois; Guyader, Mireille; Sonigo, Pierre; Brun-Vezinet, Francoise; Rey, Marianne; Rouzioux, Christine; and Katlama, Christine, 5,066,782, Cl. 530-324.000.
Sony Corporation: *See*—
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Ganse, Shigeru, 5,067,009, Cl. 358-12.000.
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, 5,066,539, Cl. 428-328.000.
Kaneko, Shinji, 5,067,026, Cl. 358-340.000.
Odaka, Kentaro; Ozaki, Shinya; Inazawa, Yoshizumi; Yamada, Masaki; Ishibashi, Hiroshi; and Iijima, Tatsuya, 5,067,131, Cl. 371-40.100.
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Southern Environmental, Inc.: *See*—
Mallory, Timothy P., Sr., 5,066,313, Cl. 55-2.000.
Southwest Research Institute: *See*—
Wenzel, Dennis J.; and McFalls, David S., II, 5,067,085, Cl. 364-474.060.
Spaeth, Werner: *See*—
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Sparton Corporation: *See*—
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Spector, George: *See*—
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Specty, Michel: *See*—
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Speedfam Company, Ltd.: *See*—
Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, 5,065,547, Cl. 51-154.000.
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Speiser, Robert D.; Bernstein, Steven; Miller, Charles N.; and Shearer, Dane, to Union Broach. Method and apparatus for manufacturing K-files and reamers. 5,065,549, Cl. 51-288.000.
Spiegel, Guenter: *See*—
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Spielberger, Richard K.; and Dunaway, Thomas J., to Honeywell Inc. Universal semiconductor chip package. 5,066,831, Cl. 174-52.400.
Spielberger, Richard K.: *See*—
Dunaway, Thomas J.; Spielberger, Richard K.; Dicks, Lori A.; and Loy, Jerald M., 5,066,614, Cl. 437-209.000.
Spielvogel, David E.: *See*—
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Spindler, Ernst: *See*—
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Spoetter, Detlef, to Robert Bosch GmbH. Pressure control valve, in particular for fuel injection systems. 5,065,725, Cl. 123-463.000.
Sporax Oy: *See*—
Tamminen, Pentti J., 5,066,555, Cl. 429-121.000.
Sporlan Valve Company: *See*—
Seener, G. Thomas; and Heffner, Joseph H., 5,065,595, Cl. 62-212.000.
Spotts, Clyde E., Jr.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.
Spraying Systems Co.: *See*—
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Sprenger, Walter: *See*—
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Square D Company: *See*—
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SRI International: *See*—
Green, Philip S.; Ostrem, John S.; and Whitehurst, Todd K., 5,065,763, Cl. 128-660.070.
Srinivasachar, Kasturi: *See*—
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Srinivasan, Ananthachari: *See*—
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SSI Medical Services, Inc.: *See*—
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Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,065,466, Cl. 5-453.000.
Staal, Gerardus B.: *See*—
Kohn, Gustave K.; Rudolph, Robin R.; Staal, Gerardus B.; Grant, David L.; Pearce, Robert C.; and Herbst, Barbara A., 5,066,482, Cl. 424-45.000.
Stadler AG: *See*—
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Stadler, Heinz; Heinzl, Alfred; and Krakowetz, Wilhelm, to Siemens Aktiengesellschaft. Electropneumatic or electrohydraulic linear drive mechanism. 5,065,663, Cl. 91-361.000.
Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Fiber supply arrangement for open-end rotor spinning. 5,065,572, Cl. 57-413.000.
Stahlecker, Fritz: *See*—
Stahlecker, Hans, 5,065,512, Cl. 29-898.090.

Stahlecker, Hans, 5,065,571, Cl. 57-105.000.
Stahlecker, Hans, to Stahlecker, Fritz, a part interest. Method of making a bearing for spindles of spinning or twisting machines. 5,065,512, Cl. 29-898.090.
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Stahlecker, Fritz, 5,065,572, Cl. 57-413.000.
Stamicarbon B.V.: *See*—
Haselier, Franciscus J. J., 5,066,725, Cl. 525-240.000.
Lemstra, Pieter J., 5,066,755, Cl. 526-348.100.
Stamm, Erich: *See*—
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Standard Oil Company, The: *See*—
—Paspek, Stephen C.; and Eppig, Christopher P., 5,066,386, Cl. 208-187.000.
—Suresh, Dev D.; DiCosimo, Robert; Loiseau, Richard; Friedrich, Maria S.; and Szabo, Hsiao-Chiung, 5,066,809, Cl. 546-250.000.
Standard Products Company, The: *See*—
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Standley, Michael P. Skateboard having lighting system. 5,067,058, Cl. 362-83.300.
Stant Inc.: *See*—
Szlaga, Emil, 5,065,782, Cl. 137-39.000.
Stapel, William C., to Ford Motor Company. Multiple parabola license plate lamp. 5,067,057, Cl. 362-83.200.
Staples, Peter J., to Parker Hannifin Corporation. Lockout device for hose fitting. 5,066,049, Cl. 285-80.000.
Stark, Steven P. Polar lighted ball. 5,066,012, Cl. 273-65.0EF.
State Scientific-Research Designing Institute for Nitrogen Industry and for Products of Organic Synthesis: *See*—
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.
Stayer, Mark L., Jr.; Antkowiak, Thomas A.; Lawson, David F.; and Koch, Russell W., to Bridgestone/Firestone, Inc. Diene polymers and copolymers terminated by reaction with N-alkyl and N-aryl imines. 5,066,729, Cl. 525-315.000.
Steen, Hans-Wilhelm, to Dragerwerk. Expiration valve control arrangement for a ventilating apparatus. 5,065,746, Cl. 128-205.240.
Stegeman, Robert H., Jr.: *See*—
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Steinbach, Stephen C.: *See*—
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Steine, Hans-Theo; and Wasserman, Christopher, to Castolin S.A. Process for producing corrosion-resistant layers. 5,066,523, Cl. 427-423.000.
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Stephenson, Dwight B.; and Marks, Dennis R., to Eaton Corporation. Fluid controller with load sensing priority flow control capability. 5,065,793, Cl. 137-625.240.
Stephenson, Ronald R.: *See*—
Lubowitz, Hyman R.; Sheppard, Clyde H.; and Stephenson, Ronald R., 5,066,541, Cl. 428-378.000.
Sterling Drug Inc.: *See*—
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Stevenson-Michener, Deborah G. C. Disposable syringe apparatus with retractable needle, locking device and cap device. 5,066,281, Cl. 604-110.000.
Stevenson, Steven. Portable apparatus to weigh and measure infants. 5,065,830, Cl. 177-263.000.
Stevenson, William H., IV. Marine sail with batten attachment assembly. 5,065,685, Cl. 114-102.000.
Stewart, Bob W., to Cincinnati Sub-Zero Products, Inc. Solid-state laser frequency conversion system. 5,066,291, Cl. 606-3.000.
Stewart, Dary R.: *See*—
Rope, Eugene L.; Stewart, Dary R.; Tricoles, Gus P.; Vance, Gary L.; Roussos, Jonathan; and Luoma, Roy S., 5,066,921, Cl. 324-639.000.
Stewart, Robert E.; and Fersht, Samuel N., to Litton Systems, Inc. Three axis inertial measurement unit with counterbalanced, low inertia mechanical oscillator. 5,065,627, Cl. 73-505.000.
Stickler, David: *See*—
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Stinnett, Carlton E.: *See*—
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Stinson, Margaret C.; and Galanek, Mitchell S., to Massachusetts Institute of Technology. Apparatus for infectious radioactive waste. 5,066,597, Cl. 435-311.000.
Stoerr, Harald: *See*—
Haeussler, Horst; Ortmann, Hubert; and Stoerr, Harald, 5,065,797, Cl. 139-448.000.
Stolar, Inc.: *See*—
Stolarczykz, Larry G., 5,066,917, Cl. 324-338.000.
Stolarczykz, Larry G., to Stolar, Inc. Long feature vertical or horizontal electrical conductor detection methodology using phase coherent electromagnetic instrumentation. 5,066,917, Cl. 324-338.000.
Stolpmann, James R.: *See*—
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Stonebraker, Richard L.; and Lasley, James, to R. R. Donnelley & Sons Company. Apparatus and method for assembling a cover case and binder. 5,066,182, Cl. 412-3.000.
Stoneham, Jeffrey R.: *See*—
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Stott, Gerald H.; and Lucas, David O., to Protein Technology, Inc. Method of disease treatment utilizing an immunologically active whey fraction. 5,066,491, Cl. 424-85.800.
Stoy, George P.; Delahanty, Francis T.; and Stoy, Vladimir A., to Kingston Technologies, Inc. Amorphous memory polymer alignment device with access means. 5,066,091, Cl. 385-98.000.
Stoy, Vladimir A.: *See*—
Stoy, George P.; Delahanty, Francis T.; and Stoy, Vladimir A., 5,066,091, Cl. 385-98.000.
Strand Lighting Limited: *See*—
Bertenshaw, David R.; Williamson, Richard; and Wright, John, 5,066,896, Cl. 315-291.000.
Stroupe, Stephen D.: *See*—
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Stubbeman, Thomas R.: *See*—
Shehan, Billy C.; Shehan, Billy C., Jr.; and Stubbeman, Thomas R., 5,065,461, Cl. 4-503.000.
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Su, Wei-Yang, to Texaco Chemical Company. Preparation of alkyl morpholinones. 5,066,804, Cl. 544-173.000.
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Sugawara, Saburo, to Asahi Kogaku Kogyo K.K. View-finding optical system capable of eyesight adjustment. 5,066,115, Cl. 359-676.000.
Sugihara, Kazutoyo; and Kinoda, Yasuhide. Belt press type dehydration device. 5,066,399, Cl. 210-401.000.
Sugimoto, Yasuhiro: *See*—
Hara, Hiroyuki; Sugimoto, Yasuhiro; and Nagamatsu, Tetsu, 5,066,996, Cl. 357-43.000.
Sugiura, Masaki: *See*—
Iwasaki, Tameo; Sugiura, Masaki; Matsuoka, Yuzo; Matsumoto, Mamoru; and Kitamura, Kazuyuki, 5,066,669, Cl. 514-449.000.
Sugiyama, Naoki, to Aisin Seiki Kabushiki Kaisha. Rotational speed detector for an internal combustion engine comprising a waveform processor for eliminating unwanted pulses. 5,066,910, Cl. 324-166.000.
Sugiyama, Shigeru. Beverage can top. 5,065,882, Cl. 220-269.000.
Sullins, Harry P., to Richland Industrial, Inc. Method of applying a refractory coating to a conduit. 5,066,350, Cl. 156-187.000.
Sulsky, Richard B.: *See*—
Demers, James P.; and Sulsky, Richard B., 5,066,658, Cl. 514-269.000.
Sulzer Brothers Limited: *See*—
Wuehrer, Wolfgang, 5,066,191, Cl. 415-35.000.
Sumikin Chemical Co. Ltd.: *See*—
Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, 5,066,384, Cl. 208-45.000.
Sumimoto Rubber Industries, Ltd.: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,065,804, Cl. 157-13.000.

Sumitomo Chemical Company, Limited: *See*—
Kadokura, Hidekimi; and Saegusa, Kunio, 5,066,530, Cl. 428-98.000.
Kitamura, Masaru; Ichihashi, Hiroshi; and Suzukamo, Gohfu, 5,066,630, Cl. 502-85.000.
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Ooka, Akihiro; and Hirano, Kazuo, 5,065,612, Cl. 73-1.00D.
Shiga, Nobuo, 5,067,006, Cl. 357-74.000.
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Iwahashi, Tohru; Sunami, Yoshihiko; Satoh, Katsumi; Ohshima, Katsuyuki; and Iwaguro, Kenichi, 5,066,384, Cl. 208-45.000.
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Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,066,666, Cl. 514-380.000.
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Nakatani, Akihiro; and Nagayasu, Hideaki, 5,065,803, Cl. 152-543.000.
Summagraphics Corporation: *See*—
Zalenski, Thomas C., 5,066,833, Cl. 178-19.000.
Summer, John D. Oral orthopedic appliance for correcting mandibular retrusion. 5,066,226, Cl. 433-19.000.
Sumrall, Terry. Board game apparatus and method of playing. 5,066,015, Cl. 273-243.000.
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Sundeen, John E.: *See*—
Antonevich, John M.; and Sundeen, John E., 5,066,600, Cl. 436-52.000.
Sunderman, Wallace H.: *See*—
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,496, Cl. 29-599.000.
Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,497, Cl. 29-564.700.
Sundstrand Corporation: *See*—
Champagne, John M., 5,066,197, Cl. 417-18.000.
Markunas, Albert L., 5,065,577, Cl. 60-450.000.
Pinchott, Gordon A., 5,065,484, Cl. 29-25.020.
Sundstrand Data Control, Inc.: *See*—
Hulsing, Rand H., II., 5,066,911, Cl. 324-207.180.
Sungene Technologies Corporation: *See*—
Hubbard, Ernest T.; Hollingsworth, Michele D.; Ram, N. V. Raghava; and Cook, Judith P., 5,066,595, Cl. 435-240.450.
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Nagata, Tsuyoshi; and Okuda, Shinji, 5,066,132, Cl. 356-432.000.
Suptitz, Eric, to Merlin Gerin. Correction procedure of the phase difference introduced by a zero sequence toroid of leakage current and isolation monitor this procedure. 5,066,920, Cl. 324-544.000.
Suresh, Dev D.; DiCosimo, Robert; Loiseau, Richard; Friedrich, Maria S.; and Szabo, Hsiao-Chiung, to Standard Oil Company, The. Preparation of 3-methylpyridine from 2-methylglutaronitrile. 5,066,809, Cl. 546-250.000.
Sutherland, W. Don. Kneader. 5,065,743, Cl. 128-60.000.
Sutton, William T.: *See*—
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,065,466, Cl. 5-453.000.
Suyama, Shuji; and Nakamura, Tomoyuki, to Nippon Oil and Fats Company, Limited. Method of polymerizing vinyl chloride. 5,066,744, Cl. 526-228.000.
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Kitamura, Masaru; Ichihashi, Hiroshi; and Suzukamo, Gohfu, 5,066,630, Cl. 502-85.000.
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Yamauchi, Ryozo; Kawakami, Noboru; and Suzuki, Fumio, 5,066,087, Cl. 385-43.000.
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Kanazawa, Hirotaka; Fujimoto, Yoshitomi; and Suzuki, Michio, 5,065,576, Cl. 60-295.000.
Suzuki, Noboru; Toji, Shigeo; and Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Autofocusing system for a camera. 5,066,968, Cl. 354-400.000.
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Hino, Seiichi; Satou, Shoichi; Koura, Kouji; and Suzuki, Osamu, 5,066,771, Cl. 528-353.000.
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Ohba, Takayuki; Miyagaki, Shinji; Hara, Tatsushi; Morishita, Kenji; Suzuki, Seiichi; and Ri, Seigen, 5,066,612, Cl. 437-192.000.
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Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, to Japan Aviation Electronics Industry, Ltd.; and NEC Corporation. Apparatus for carrying out connection and disconnection of a circuit member to an electrical connector. 5,065,941, Cl. 439-264.000.
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Suzuki, Tauyoshi: *See*—
Nakata, Takashi; and Suzuki, Tauyoshi, 5,066,974, Cl. 355-71.000.
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Svensson, Bengt: *See*—
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Swanson, David A.: *See*—
Howland, Leland L.; Parker, Jan M.; Herrig, Doyle G.; and Swanson, David A., 5,065,587, Cl. 62-131.000.
Swanson, Stephen: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.
Sweet, Roger L.: *See*—
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Swenson, Bryan R.: *See*—
Schmidt, Roger A.; and Swenson, Bryan R., 5,066,690, Cl. 523-423.000.
Swenson, Henry F. Dressing tool for form dressing of a grinding wheel. 5,065,733, Cl. 125-39.000.
Swim, Ollie C., Jr. Countersink tool assembly. 5,066,172, Cl. 408-1.00R.
Systems Furniture Company: *See*—
DeGelder, Jacob, 5,066,069, Cl. 297-374.000.
Szabo, Hsiao-Chiung: *See*—
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O'Connor, Kevin M.; Szajewski, Richard P.; and Bagchi, Pranab, 5,066,572, Cl. 430-503.000.
Sze, Cho Y.: *See*—
McGraw, Thomas C.; Van Ryne, Randall E.; Scarlata, Richard F.; and Sze, Cho Y., 5,065,996, Cl. 271-176.000.
Szenger, Franz, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Length or angle measuring device. 5,065,525, Cl. 33-702.000.
Szlaga, Emil, to Stant Inc. Tank venting control assembly. 5,065,782, Cl. 137-39.000.
Szpak, Anthony D.: *See*—
English, Philip H.; and Szpak, Anthony D., 5,066,155, Cl. 401-175.000.
Szudy, Katherine A. Handrail for aiding visually handicapped. 5,065,837, Cl. 182-18.000.
Szumigala, James M.: *See*—
Gehly, Joel C.; Zolner, David; and Szumigala, James M., 5,067,064, Cl. 362-277.000.
Szwerc, Joseph A.: *See*—
Arciszewski, Henry E.; Porzio, Linda A.; Chiang, Bin Y.; Spotts, Clyde E., Jr.; McHugh, Kevin; and Szwerc, Joseph A., 5,066,499, Cl. 426-19.000.
Tabor, icky L.; and Allen, James A., to Dow Chemical Company, The. Resin blends of maleic anhydride grafts of olefin polymers for extrusion coating onto metal foil substrates. 5,066,542, Cl. 428-461.000.
Tachi, Hiroshi: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.
Tachibana, Hiroyuki: *See*—
Kobashi, Koji; Miyata, Koichi; Kumagai, Kazuo; Inoue, Takayoshi; Tachibana, Hiroyuki; and Nakaue, Akimitsu, 5,066,938, Cl. 338-22.0SD.
Tachibana, Tetsuo: *See*—
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Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.

Taguchi, Naoto: *See*—
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Kato, Tetsuo; Fukuda, Kiyohito; Watanabe, Hiroshi; Terada, Katsuaki; and Taguchi, Naoto, 5,066,252, Cl. 439-752.000.

Taguchi, Toshiki: *See*—
Nakamura, Koki; Ito, Takayuki; Tsukase, Masaaki; and Taguchi, Toshiki, 5,066,577, Cl. 430-562.000.

Taguchi, Yukihiko, to Sanden Corporation. Control apparatus used for a refrigerant circuit having a compressor with a variable displacement mechanism. 5,065,589, Cl. 62-161.000.

Tajima, Ikuo; and Hasegawa, Hideo, to Tokai Kogyo Mishin Kabushiki Kaisha. Embroidering machine. 5,065,682, Cl. 112-103.000.

Tajima, Norio: *See*—
Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.

Takaba, Tetsuro: *See*—
Hosokai, Tetsushi; Takaba, Tetsuro; Ishihara, Toshihiro; and Kobayashi, Hideki, 5,065,717, Cl. 123-339.000.

Takabayashi, Kiyonobu: *See*—
Kodaka, Yoshiro; and Takabayashi, Kiyonobu, 5,066,103, Cl. 359-823.000.

Takada, Noboru; and Osawa, Masami, to Toko Kabushiki Kaisha. Helical filter. 5,066,932, Cl. 333-202.000.

Takada, Shigeki, to Yoshida Kogyo K. K. Method for producing curved slide fastener chains and method for producing curved slide fasteners. 5,065,491, Cl. 29-408.000.

Takagaki, Katsumi, to Fuji Jukogyo Kabushiki Kaisha. Lubricating system for a vertical shaft engine. 5,065,841, Cl. 184-6.180.

Takagawa, Ryozo: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.

Takagi, Koichi: *See*—
Taura, Yoshiharu; Yuzaki, Yoshinori; and Takagi, Koichi, 5,066,184, Cl. 413-4.000.

Takagi, Tadao; Saya, Daisuke; and Nemoto, Shigehisa, to Nikon Corporation. Ultrasonic motor having high drive efficiency. 5,066,884, Cl. 310-323.000.

Takahara, Katsuo; Okajima, Shigeru; and Onodera, Tugio, to Mitsuba Electric Mfg. Co., Ltd. Method of forming shaped configuration at end of long element. 5,065,605, Cl. 72-340.000.

Takaharu, Nakamura: *See*—
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, to NKK Corporation. Method for smelting reduction of iron ore and apparatus therefor. 5,065,985, Cl. 266-156.000.

Takahashi, Masami: *See*—
Nishikawa, Kinsaku; Yokoyama, Hiroshi; and Takahashi, Masami, 5,066,439, Cl. 264-103.000.

Takahashi, Mitsuo, to Seikoh Giken Co., Ltd. Variable optical fiber light attenuator. 5,066,094, Cl. 385-73.000.

Takahashi, Motoichi: *See*—
Kobori, Takuji; Takahashi, Motoichi; Nasu, Tadashi; Niwa, Naoki; Kurata, Narito; Hirai, Junichi; and Adachi, Yoshinori, 5,065,552, Cl. 52-1.000.

Takahashi, Norio: *See*—
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.

Takahashi, Osamu: *See*—
Sato, Tadahisa; Takahashi, Osamu; Naruse, Hideaki; and Mizukawa, Yuki, 5,066,575, Cl. 430-558.000.

Takahashi, Takayuki: *See*—
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Shimizu, Hideo; and Takahashi, Yasuhiro, 5,067,117, Cl. 369-116.000.

Takahashi, Yasushi, to NEC Corporation. Method for electrically detecting positional deviation of contact hole in semiconductor device. 5,066,908, Cl. 324-158.00R.

Takahashi, Yohnosuke, to Fuji Photo Film Co., Ltd. Electronic still camera capable of selecting recording media. 5,067,029, Cl. 358-909.000.

Takaishi, Kazushige: *See*—
Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, 5,066,381, Cl. 204-298.120.

Takami, Masao: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,065,804, Cl. 157-13.000.

Takamori, Nobuyuki: *See*—
Ohta, Kenji; Murakami, Yoshiteru; Takamori, Nobuyuki; Hijikata, Kenichi; Shingyoji, Takyuki; and Takaishi, Kazushige, 5,066,381, Cl. 204-298.120.

Takano, Yoshiaki; Sato, Koichi; and Shimose, Yutaka, to Sanyo Electric Co., Ltd. Cold box. 5,065,592, Cl. 62-180.000.

Takao, Itaru: *See*—
Narushima, Masaki; and Takao, Itaru, 5,065,495, Cl. 29-559.000.

Takarada, Mitsuhiro: *See*—
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.

Takasago International Corporation: *See*—
Sayo, Noboru; Kumobayashi, Hidenori; Akutagawa, Susumo; Noyori, Ryoji; and Takaya, Hidemasa, 5,066,815, Cl. 549-319.000.

Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, to Eisai Co., Ltd. 3-propenylcephem derivative. 5,066,812, Cl. 548-128.000.

Takaya, Hidemasa: *See*—
Sayo, Noboru; Kumobayashi, Hidenori; Akutagawa, Susumo; Noyori, Ryoji; and Takaya, Hidemasa, 5,066,815, Cl. 549-319.000.

Takayama, Syuichi: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Take, Kazuhiko: *See*—
Shiokawa, Youichi; Okumura, Kazuo; Take, Kazuhiko; and Tsubaki, Kazunori, 5,066,680, Cl. 514-622.000.

Takechi, Satoshi: *See*—
Kotachi, Akiko; Takechi, Satoshi; and Nakamura, Yuko, 5,066,751, Cl. 526-279.000.

Takeda Chemical Industries, Ltd.: *See*—
Miyabayashi, Shigeaki; Sakamoto, Takuro; Kanai, Hiroshi; and Oka, Joji, 5,066,757, Cl. 528-45.000.

Takeda, Hiroshi: *See*—
Yamazaki, Hideki; Takeda, Hiroshi; and Yokota, Yoshikazu, 5,067,097, Cl. 395-115.000.

Takeda, Toshihiko: *See*—
Yoshioka, Seishiro; Nomura, Ichiro; Suzuki, Hidetoshi; Takeda, Toshihiko; Kaneko, Tetsuya; Banno, Yoshikazu; and Yokono, Kojiro, 5,066,883, Cl. 313-309.000.

Takeda, Yuji, to Toyota Jidosha Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine. 5,065,724, Cl. 123-425.000.

Takegahara, Takashi: *See*—
Seki, Masaki; Takegahara, Takashi; and Arakaki, Takeshi, 5,067,087, Cl. 364-474.240.

Takehana, Sakae: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Takehara, Masataka: *See*—
Michii, Kazunari; and Takehara, Masataka, 5,067,005, Cl. 357-72.000.

Takemoto, Toyoki; Komeda, Tadao; Yamada, Haruyasu; and Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Method of making semiconductor IC including polar transistors. 5,066,602, Cl. 437-31.000.

Takenaka, Yasuo: *See*—
Kobori, Takuji; Yamada, Shunichi; Ban, Shigeru; Ishii, Koji; Nishimura, Isao; Ishida, Masatoshi; Sato, Kuniaki; Takenaka, Yasuo; Maeda, Shozo; and Tagami, Jun, 5,065,555, Cl. 52-167.0DF.

Takeuchi, Toshiyuki: *See*—
Ohta, Shuji; and Takeuchi, Toshiyuki, 5,065,664, Cl. 91-420.000.

Takken, Paul E.; Scheckel, Robert G.; and Peo, Steven D., to BPS Systems, Inc. Apparatus for removing debris from a cutting bed. 5,065,469, Cl. 15-89.000.

Talati, Kirit K.; and Lackie, C. Willard, to VISystems, Inc. Virtual software machine which preprocesses application program to isolate execution dependencies and uses target computer processes to implement the execution dependencies. 5,067,072, Cl. 395-650.000.

Talgam, Yoav; Klingshirn, James A.; and Gullette, James B., to Motorola, Inc. Cache which provides status information. 5,067,078, Cl. 395-400.000.

Tameris, Hendrikus M., to Crellin B.V. Plastic cheese mold with drainage slits formed during the manufacture of the upright wall by injection moulding. 5,065,671, Cl. 99-456.000.

Tamglass Oy: *See*—
Lehto, Esko O.; and Vehmas, Jukka H., 5,066,320, Cl. 65-106.000.

Taminaga, Takayuki: *See*—
Deguchi, Katsuyasu; Mizoguchi, Takatoshi; Taminaga, Takayuki; and Fujii, Akiyoshi, 5,066,960, Cl. 346-76.0PH.

Tamm, Rolf; Rodel, Gunther; and Stengele, Erich, to Bodenseewerk Perkin Elmer GmbH. Device for electrothermal atomizing of samples for spectroscopic purposes. 5,066,123, Cl. 356-312.000.

Tamminen, Pentti J., to Sporax Oy. Contact arrangement for a galvanic battery. 5,066,555, Cl. 429-121.000.

Tamura, Nobuhiko: *See*—
Ozato, Yukinori; Tamura, Nobuhiko; Masumori, Hiroaki; Yamamoto, Michihiro; Kojima, Atsuyuki; Nishikaku, Fumio; and Kimura, Yoshihiko, 5,066,666, Cl. 514-380.000.

Tamura, Tadahiko: *See*—
Kinuhata, Satoru; Takami, Masao; Shibata, Eiji; and Tamura, Tadahiko, 5,065,804, Cl. 157-13.000.

Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, to Hitachi Chemical Company, Ltd. Process for producing toner for electrophotography. 5,066,560, Cl. 430-137.000.

Tanabe, Haruyoshi: *See—*
Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, 5,065,985, Cl. 266-156.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Iwasaki, Tameo; Sugiura, Masaki; Matsuoka, Yuzo; Matsumoto, Mamoru; and Kitamura, Kazuyuki, 5,066,669, Cl. 514-449.000.
Suzuki, Takashi; Yamamura, Minehiko; and Yamada, Shinichi, 5,066,825, Cl. 560-56.000.

Tanaka, Hitoshi; and Kosako, Kosei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Waterproof and/or water-resistant camera. 5,066,965, Cl. 354-64.000.

Tanaka, Kunio: *See—*
Yoshida, Yoshikazu; Tanaka, Kunio; and Nishikawa, Yukio, 5,065,697, Cl. 118-719.000.

Tanaka, Mitsutoshi: *See—*
Kawasaki, Kazuya; Tanaka, Mitsutoshi; Amano, Yoshikazu; and Katsuyama, Harumi, 5,066,462, Cl. 422-56.000.

Tanaka, Shigeyoshi: *See—*
Tan, Ryoji; Tanaka, Shigeyoshi; Kishi, Ken-ichi; Iguchi, Yasuyuki; Kudo, Takeo; Amano, Takashi; and Kohno, Hideki, 5,066,560, Cl. 430-137.000.

Tanaka, Takeshi: *See—*
Yamamoto, Tadashi; Kohyama, Yusuke; and Tanaka, Takeshi, 5,066,609, Cl. 437-52.000.

Tanaka, Yoshikazu: *See—*
Iwasawa, Kyoko; Tanaka, Yoshikazu; and Gotou, Shizuo, 5,067,068, Cl. 395-650.000.

Tanaka, Yoshinori: *See—*
Eimori, Takahisa; Satoh, Shinichi; Wakamiya, Wataru; Ozaki, Hiroji; and Tanaka, Yoshinori, 5,067,000, Cl. 357-53.000.

Tanashin Denki Co., Ltd.: *See—*
Kido, Kunio, 5,067,034, Cl. 360-74.100.

Tandem Computers Incorporated: *See—*
Blakkan, John A., 5,067,132, Cl. 371-52.000.

Tanemoto, Kei; Ando, Akiro; and Kubo, Hiroshi, to Nippon Steel Corporation. Method for producing PLZT powder. 5,066,617, Cl. 501-134.000.

Tang, Reginald T.; Mares, Frank; Boyle, William J., Jr.; Chiu, Tin-Ho; and Patel, Kundan M., to Allied-Signal Inc. Medical devices fabricated totally or in part from copolymers of recurring units derived from cyclic carbonates and lactides. 5,066,772, Cl. 528-354.000.

Tani, Kazunori: *See—*
Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, 5,065,547, Cl. 51-154.000.
Shimizu, Tatsuo; Ozawa, Kazunori; Yazawa, Kenji; and Tani, Kazunori, 5,065,548, Cl. 51-154.000.

Tani, Shichisei: *See—*
Sagawa, Takayoshi; and Tani, Shichisei, 5,065,800, Cl. 141-67.000.

Taniguchi, Akira: *See—*
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Taniguchi, Takako: *See—*
Sato, Yasuo; Kato, Shinsuke; Taniguchi, Takako; Atsumi, Kunio; Hachisu, Mitsugu; and Shibahara, Seiji, 5,066,677, Cl. 514-563.000.

Tanizawa, Hideichi: *See—*
Usui, Junichi; and Tanizawa, Hideichi, 5,065,963, Cl. 246-187.00B.

Tanken Seiko Kabushiki Kaisha: *See—*
Ohbori, Hiroshi; and Yamauchi, Yuji, 5,066,134, Cl. 366-102.000.

Tapper, Lee C., to R. R. Donnelley & Sons Company. Boundary layer air scraper for a rotogravure printing press. 5,065,675, Cl. 101-153.000.

Tappon, Ellen R.: *See—*
Smyth, John B., Jr.; and Tappon, Ellen R., 5,066,357, Cl. 156-643.000.

Taraban, Nikolai T.: *See—*
Zlobin, Mikhail N.; Metsik, Viktor M.; Nemarov, Alexandr A.; Permyakov, Georgy P.; and Taraban, Nikolai T., 5,066,389, Cl. 209-170.000.

Tarng, Min M. Tangs drinking can and cap. 5,065,881, Cl. 220-258.000.

Tarzwell, John W.; Tarzwell, Patrick J.; Myers, Theodore R.; Hyland, Barry M.; Dahl, John C.; and Eddings, Jack L., to Cerprobe Corporation. Probe system for device and circuit testing. 5,066,907, Cl. 324-158.00P.

Tarzwell, Patrick J.: *See—*
Tarzwell, John W.; Tarzwell, Patrick J.; Myers, Theodore R.; Hyland, Barry M.; Dahl, John C.; and Eddings, Jack L., 5,066,907, Cl. 324-158.00P.

Tateoka, Masamichi: *See—*
Makino, Jun; and Tateoka, Masamichi, 5,066,083, Cl. 359-213.000.

Taumberger, Franz: *See—*
Greil, Andreas; and Taumberger, Franz, 5,066,093, Cl. 385-33.000.

Taura, Yoshiharu; Yuzaki, Yoshinori; and Takagi, Koichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for seaming packed cans. 5,066,184, Cl. 413-4.000.

Tawada, Yoshihisa: *See—*
Nakayama, Takehisa; Hayashi, Akimine; Kondo, Masataka; Murakami, Satoru; Yamaguchi, Minori; and Tawada, Yoshihisa, 5,066,861, Cl. 250-370.090.

Taylor, Bruce S.; and Balakrishnan, Ramesh, to Measurex Corporation. Cross-directional moisture control system and method. 5,065,673, Cl. 100-40.000.

Taylor, Chandler R., Jr.; and Moses, Meredith, to A. H. Robins Company, Incorporated. 2-aryl-3-heterocyclicmethyl-3H-imidazo[4,5-b]pyridines as anxiolytics and anticonvulsants. 5,066,654, Cl. 514-256.000.

Taylor, Lewis C.: *See—*
Forrest, William J.; and Taylor, Lewis C., 5,065,739, Cl. 128-20.000.

Tazi, Mohammed: *See—*
Helioff, Michael W.; Plochocka, Krystyna; and Tazi, Mohammed, 5,066,481, Cl. 424-47.000.

TDK Corporation: *See—*
Nakagawa, Shiro; Domon, Taisuke; Imai, Takehiro; and Tsuchida, Atsuko, 5,065,625, Cl. 73-336.500.

Teasley, Mark F.: *See—*
Dunlap, Beth E.; Rogers, Fulton F., Jr.; and Teasley, Mark F., 5,066,445, Cl. 264-176.100.

Technosystem Limited: *See—*
Braithwaite, Philip W., 5,066,280, Cl. 604-110.000.

Tektronix, Inc.: *See—*
Jackson, Ronald M., 5,067,130, Cl. 371-22.100.

Telecommunications Co., Ltd.: *See—*
Kim, Byeong-Yun; Jung, Tae-Sung; and Park, Yong-Bo, 5,067,109, Cl. 365-189.050.

Telecommunications Research Laboratories: *See—*
Moore, Thomas E., 5,067,126, Cl. 370-112.000.

Teledyne Ind. Inc.: *See—*
Willbanks, Henry O., 5,066,852, Cl. 219-544.000.

Teledyne Industries, Inc.: *See—*
Kadis, Paul M., 5,065,606, Cl. 72-348.000.
Kadis, Paul M.; and Hiney, Leonard L., 5,065,607, Cl. 72-351.000.

Teleflex Incorporated: *See—*
Ellis, Larry G.; and Carter, William R., 5,065,961, Cl. 244-137.400.

Telefunken Electronic GmbH: *See—*
Hantsch, Hartmut; Thoma, Peter; and Mahalek, Josef, 5,067,076, Cl. 395-275.000.

Telefunken Systemtechnik GmbH: *See—*
Huder, Bernhard, 5,066,959, Cl. 343-786.000.

Tempel, Ernst; and Grimbu / hler-Can, Pia, to Ciba-Geigy Corporation. Liquid metal complex dye preparations, process for their preparation and their use. 5,066,309, Cl. 8-527.000.

Temple University of the Commonwealth System of Higher Education: *See—*
Huang, Tur-Fu; Niewiarowski, Stefan; Holt, John C.; and Lukasiewicz, Hanna, 5,066,592, Cl. 435-240.200.

Tenneco Canada Inc.: *See—*
Zell, Michael S.; and Fredette, Maurice C. J., 5,066,477, Cl. 423-479.000.

Terada, Hirokiyo: *See—*
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.

Terada, Katsuaki: *See—*
Kato, Tetsuo; Fukuda, Kiyohito; Watanabe, Hiroshi; Terada, Katsuaki; and Taguchi, Naoto, 5,066,252, Cl. 439-752.000.

Terada, Osamu: *See—*
Takahashi, Kenji; Iwasaki, Katsuhiro; Inoue, Shigeru; Tanabe, Haruyoshi; Kawakami, Masahiro; Yamada, Kenzo; and Terada, Osamu, 5,065,985, Cl. 266-156.000.

Terada, Tsutomu: *See—*
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; Terada, Tsutomu; Yamana, Masayuki; Nakai, Kazuhiro; and Araki, Takayuki, 5,066,747, Cl. 526-249.000.

Teratani, Masakuni: *See—*
Yoshida, Takahoko; Muranaka, Masayuki; Yoshikawa, Hiroki; Hirata, Koji; Yoshizaki, Isao; Teratani, Masakuni; and Konuma, Nobuhiro, 5,066,099, Cl. 359-457.000.

Terbrack, Ulrich: *See—*
Siol, Werner; and Terbrack, Ulrich, 5,066,718, Cl. 525-84.000.

Terex Corporation: *See—*
Loeber, Frederick W.; and Greene, George O., 5,065,814, Cl. 165-41.000.

Terni, Patrizia; Maiorana, Stefano; Papagni, Antonio; and Pagella, Piergiuseppe, to Mediolanum Farmaceutici Srl. Process for preparing pyrido-benzothiazine derivatives having high antibacterial activity and high bioavailability to tissues. 5,066,802, Cl. 544-32.000.

Terrell, Joye L. Finger nail polish removing device. 5,065,778, Cl. 132-74.500.

Terrell, Nancy E.: *See—*
Schuh, Robert R.; Terrell, Nancy E.; Kreiseder, Walter J.; and Vogel, Allen J., 5,065,887, Cl. 220-338.000.

Terumo Kabushiki Kaisha: *See—*
Ikeda, Makoto; and Toriumi, Makoto, 5,066,141, Cl. 374-169.000.
Yamaguchi, Shuichiro; Shimomura, Takeshi; Uchida, Naoto; Katsube, Teruaki; and Oyama, Noboru, 5,066,383, Cl. 204-435.000.

Tessaro, John E., to Westinghouse Electric Corp. Single-step multiple repositionings of control rod cluster assembly during each nuclear reactor fuel cycle. 5,066,451, Cl. 376-237.000.

Tetratec Corporation: *See—*
Dillon, Joseph E.; and Dillon, Mark E., 5,066,683, Cl. 521-54.000.

Texaco Chemical Company: *See—*
Su, Wei-Yang, 5,066,804, Cl. 544-173.000.

Texaco Inc.: *See—*
Chan, Ting Y., 5,066,467, Cl. 422-140.000.
Huang, Wann-Sheng; and Hsu, Jack J., 5,065,821, Cl. 166-245.000.
Migdal, Cyril A.; Shirodkar, Shailaja M.; DeRosa, Thomas F.; and Miller, Edward F., 5,066,412, Cl. 252-54.600.

Texas Instruments Incorporated: *See—*
Arjmand, Masud M., 5,067,158, Cl. 381-51.000.
Banerjee, Sanjay K., 5,066,607, Cl. 437-52.000.
Schenck, Stephen R., 5,066,872, Cl. 307-443.000.

Thelissen, Guillaume Francois G., to Du Pont de Nemours, E. I., and Company. Filter connector with latchable mounting frame. 5,066,931, Cl. 333-182.000.

Theobald, Hans: *See—*
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

Thermalock Products, Inc.: *See—*
Kennedy, Francis A.; Neff, John P.; and Blake, Kenneth J., 5,066,440, Cl. 264-69.000.

Thermo Electron-Web Systems, Inc.: *See—*
Goodnow, Ronald F.; and Reid, Robert A., 5,066,364, Cl. 162-281.000.

Thermo King Corporation: *See—*
Howland, Leland L.; Parker, Jan M.; Herrig, Doyle G.; and Swanson, David A., 5,065,587, Cl. 62-131.000.

Thimineur, Raymond J.: *See—*
Raleigh, William J.; Thimineur, Raymond J.; and Zotto, Anthony A., 5,066,756, Cl. 528-32.000.

Tholerus, Jan, to Bindomatic AB. Method for binding sheaves of paper into covers. 5,066,183, Cl. 412-4.000.

Thoma, Peter: *See—*
Hantsch, Hartmut; Thoma, Peter; and Mahalek, Josef, 5,067,076, Cl. 395-275.000.

Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., to SSI Medical Services, Inc. Quick disconnect coupling for a low air loss patient support. 5,065,466, Cl. 5-453.000.

Thompson, Christoper M.: *See—*
Farfaglia, Leonard T., deceased; Campbell, Timothy J.; Gipson, Billy P.; Matambo, Thompson; and Thompson, Christoper M., 5,065,597, Cl. 62-262.000.

Thomson Consumer Electronics, Inc.: *See—*
Doty, James H., II; Albean, David L.; and Blatter, Harold, 5,066,868, Cl. 307-262.000.

Thomson Tubes Electroniques: *See—*
Salavin, Serge; Deschamps, Jacques; Gay, Michel; and Specty, Michel, 5,066,890, Cl. 313-585.000.

Thoren, Werner: *See—*
Albarda, Scato; Thoren, Werner; Kahning, Stefan; and Vehrens, Peter, 5,065,978, Cl. 251-129.060.

Thornburg, Theodore S.: *See—*
Sandor, Robert B.; and Thornburg, Theodore S., 5,066,697, Cl. 524-233.000.

Threeco: *See—*
Pino, Giovanni; Scherer, Thomas W.; and Stephens, Ruth A., 5,065,909, Cl. 222-484.000.

Tietjen, Marlene: *See—*
Brieva, Hernando; Jose, Natividad; and Tietjen, Marlene, 5,066,485, Cl. 424-63.000.

Tilman, Paul, to Zip-Pak Incorporated. Sectional or pre-cut zipper strips, magazine storage and feed means, and method. 5,065,899, Cl. 221-305.000.

Timson, Daniel R. E.: *See—*
Combridge, Brian L.; Robson, David; and Timson, Daniel R. E., 5,067,015, Cl. 358-133.000.

Titan Linkabit Corporation: *See—*
Weinert, Fritz K., 5,067,140, Cl. 375-77.000.

Tjahaja, Surja; and Nodvik, Robert L. Disposable portable urinal. 5,065,459, Cl. 4-144.200.

Tjoe, Sioe-Heng A.: *See—*
Chung, Ding Y.; Debroy, Tapan K.; and Tjoe, Sioe-Heng A., 5,066,688, Cl. 523-415.000.

Toelke, Lester W., to Hayden, Jack W. Multiple diameter pipe test end closure. 5,065,617, Cl. 73-49.800.

Toho Kagaku Kogyo Co., Ltd: *See—*
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.

Toide, Eiichi; Shikama, Shinsuke; and Kubota, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Optical head apparatus. 5,066,138, Cl. 369-112.000.

Toji, Shigeo: *See—*
Suzuki, Noboru; Toji, Shigeo; and Kawasaki, Masahiro, 5,066,968, Cl. 354-400.000.

Tokai Kogyo Mishin Kabushiki Kaisha: *See—*
Tajima, Ikuo; and Hasegawa, Hideo, 5,065,682, Cl. 112-103.000.

Toko Kabushiki Kaisha: *See—*
Takada, Noboru; and Osawa, Masami, 5,066,932, Cl. 333-202.000.

Tokugawa, Osamu, to Nippon Seiko Kabushiki Kaisha. Adjustable shoulder anchorage. 5,066,043, Cl. 280-808.000.

Tokusa, Kenji: *See—*
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.

Tokyo Electric Co., Ltd.: *See—*
Hosoya, Masahiro; Saito, Mitsunaga; Sato, Shuitsu; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, 5,066,982, Cl. 355-269.000.

Tokyo Electron Limited: *See—*
Narushima, Masaki; and Takao, Itaru, 5,065,495, Cl. 29-559.000.

Tolliver, Howard R.: *See—*
Kult, Roger R.; Bailey, Terry R.; and Tolliver, Howard R., 5,066,098, Cl. 359-540.000.

Tomanovits, John, to Philip Morris Inc. Apparatus for forming inner-frame for cigarette pack with rounded corners. 5,066,270, Cl. 493-435.000.

Tomasic, Jelka: *See—*
Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, 5,066,642, Cl. 514-18.000.

Tomasini, Ercole: *See—*
Negri, Febo R.; and Tomasini, Ercole, 5,066,232, Cl. 433-224.000.

Tomberlin, Rand K. Returning flying toy. 5,066,258, Cl. 446-40.000.

Tomihashi, Nobuyuki: *See—*
Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; Terada, Tsutomu; Yamana, Masayuki; Nakai, Kazuhiro; and Araki, Takayuki, 5,066,747, Cl. 526-249.000.

Tomioka, Yutaka; Nakanishi, Satoru; Shintake, Seizi; and Yoneda, Hideki, to Toto Ltd. Filler for patterning of ceramics product and process for producing the same. 5,066,333, Cl. 106-400.000.

Tomosy, Geza. Spill containment device for a ship. 5,066,164, Cl. 405-66.000.

Tomotake, Atsushi: *See—*
Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, 5,066,574, Cl. 430-557.000.

Tomotake, Mayumi: *See—*
Kubota, Toru; Tomotake, Mayumi; Ohya, Hidenobu; Tomotake, Atsushi; and Mizukura, Noboru, 5,066,574, Cl. 430-557.000.

Tone, Shoichi, to Murata Kikai Kabushiki Kaisha. Automatic inspecting apparatus for yarn joining device. 5,065,949, Cl. 242-35.50R.

Tonegawa, Takeshi: *See—*
Morimoto, Kiyoshi; Itoh, Shigeo; Tonegawa, Takeshi; and Niiyama, Takahiro, 5,066,885, Cl. 313-340.000.

Tonen Corporation: *See—*
Doi, Yoshiharu; Ueki, Satoshi; and Furuhashi, Hiroyuki, 5,066,754, Cl. 526-336.000.

Tonomoto, Yoshihiro, to Fujitsu Limited. Cleaning unit for cleaning recording medium of an electrophotographic apparatus. 5,066,983, Cl. 355-297.000.

Toolrite Manufacturing Company: *See—*
Werner, John A., 5,065,653, Cl. 83-199.000.

Toriumi, Makoto: *See—*
Ikeda, Makoto; and Toriumi, Makoto, 5,066,141, Cl. 374-169.000.

Tortonese, Marco: *See—*
Quate, Calvin F.; and Tortonese, Marco, 5,066,358, Cl. 156-647.000.

Toshihiko, Naito: *See—*
Takashi, Kamiya; Toshihiko, Naito; Shigeto, Negi; Yuuki, Komatu; Yasunobu, Kai; Takaharu, Nakamura; Isao, Sugiyama; Yoshimasa, Machida; Seiichiro, Nomoto; Kyosuke, Kitoh; Kanemasa, Katsu; and Hiroshi, Yamauchi, 5,066,812, Cl. 548-128.000.

Toto Ltd.: *See—*
Tomioka, Yutaka; Nakanishi, Satoru; Shintake, Seizi; and Yoneda, Hideki, 5,066,333, Cl. 106-400.000.

Toyo Tire & Rubber Company, Limited: *See—*
Hayashi, Hirofumi; and Matsumoto, Yo, 5,066,702, Cl. 524-426.000.

Toyosawa, Shinichi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Kawagoe, Takahiro, to Bridgestone Corporation; and Seiko Electric Components Ltd. Non-aqueous electrolyte secondary cell. 5,066,556, Cl. 429-194.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Nomura, Yoshihisa; Kato, Masahiko; and Nishii, Michiharu, 5,065,573, Cl. 60-551.000.
Suzuki, Katsuhiro; Nishimura, Akira; Yamauchi, Takatsugu; Nagata, Kazuhisa; and Ochiai, Hironori, 5,066,068, Cl. 296-221.000.
Takeda, Yuji, 5,065,724, Cl. 123-425.000.

Toyota Jidosha Kabushiki Kaisha, Toyoto: *See—*
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.

Travanti Corinti, Mariano; and Nepi Campitelli, Giovanni, to Bombas Auriferas & Equipos Mineros B.A.E M., C.A. Water pump housing closure and a water pump gasket adjustment mechanism. 5,066,193, Cl. 415-201.000.

Treible, Edwin S.: *See—*
Hollesen, David B.; Kaczorek, Joseph W.; and Treible, Edwin S., 5,065,692, Cl. 118-302.000.

Tresper, Erhard: *See—*
Dorf, Ernst-Ulrich; Reinking, Klaus; Jakob, Wolfgang; Tresper, Erhard; and Russeler, Wolfgang, 5,066,775, Cl. 528-388.000.
Wehnert, Wolfgang; Reinking, Klaus; Bier, Peter; Kraft, Klaus; and Tresper, Erhard, 5,066,704, Cl. 524-449.000.

Tribology Systems, Inc.: *See—*
Sibley, Lewis B.; and Kelly, C. Brian, 5,066,145, Cl. 384-463.000.

Tricoles, Gus P.: *See—*
Rope, Eugene L.; Stewart, Dary R.; Tricoles, Gus P.; Vance, Gary L.; Roussos, Jonathan; and Luoma, Roy S., 5,066,921, Cl. 324-639.000.

Trijicon, Inc.: *See—*
Bindon, Glyn A. J., 5,065,519, Cl. 33-241.000.

Trisport Ltd.: *See*—
Collins, Roy S., 5,065,534, Cl. 36-134.000.
Troster, Harry, to Mercedes-Benz AG. Apparatus for fixing the hydraulic unit of an ABS and/or an ASR in the motor space of a street vehicle. 5,066,076, Cl. 303-113.000.
Troude, Roland: *See*—
Dekeyser, Bernard; and Troude, Roland, 5,066,095, Cl. 385-99.000.
Troutner, David E.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 5,066,478, Cl. 424-1.100.
Trudeau, Albert D. Dart card game board. 5,066,020, Cl. 273-408.000.
Trumbo, Todd A.: *See*—
Sangokoya, Samuel A.; Howie, Milham S.; and Trumbo, Todd A., 5,066,631, Cl. 502-152.000.
TRW Inc.: *See*—
Urbach, Brian A., 5,066,159, Cl. 403-134.000.
Wood, Ruey E., 5,066,160, Cl. 403-140.000.
TRW Repa GmbH: *See*—
Fohl, Artur, 5,066,042, Cl. 280-806.000.
Schmid, Johannes; and Kielwein, Thomas, 5,065,953, Cl. 242-74.000.
TRW Technar Inc.: *See*—
Gunning, Kevin J.; and Gallup, David F., 5,066,836, Cl. 200-61.45R.
Gunning, Kevin J.; Gallup, David F.; and Bell, Lon E., 5,066,837, Cl. 200-61.45R.
TRW Vehicle Safety Systems Inc.: *See*—
Cotter, Patrick J., 5,065,954, Cl. 242-107.700.
Tsakiropoulos, Panayiotis: *See*—
Jones, Howard; Tsakiropoulos, Panayiotis; Pratt, Charles R.; Gardiner, Robert W.; and Restall, James E., deceased, 5,066,457, Cl. 420-552.000.
Tsaur, Bor-Yeu: *See*—
Chen, Chenson K.; and Tsaur, Bor-Yeu, 5,066,610, Cl. 437-83.000.
Tseng, Chun-Chu. Shelf frame. 5,065,873, Cl. 211-187.000.
Tsinberg, Mikhail: *See*—
Basile, Carlo; Cavallerano, Alan P.; and Tsinberg, Mikhail, 5,067,011, Cl. 358-23.000.
Tsubaki, Kazunori: *See*—
Shiokawa, Youichi; Okumura, Kazuo; Take, Kazuhiko; and Tsubaki, Kazunori, 5,066,680, Cl. 514-622.000.
Tsuboi, Shinichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Moriya, Koichi; Honda, Ikuro; Hattori, Yumi; and Shibuya, Katsuhiko, 5,066,808, Cl. 514-231.500.
Tsuchida, Atsuko: *See*—
Nakagawa, Shiro; Domon, Taisuke; Imai, Takehiro; and Tsuchida, Atsuko, 5,065,625, Cl. 73-336.500.
Tsuchida, Shinji, to Canon Kabushiki Kaisha. Telephone system for ISDN and public telephone networks. 5,067,125, Cl. 370-79.000.
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Aoki, Shinichiro; Kawata, Koichi; Morita, Yasuyuki; Mori, Akitoshi; Hashidate, Yuji; Tsukada, Tatsuki; and Nakamura, Hiroshi, 5,066,101, Cl. 359-638.000.
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Nakamura, Koki; Ito, Takayuki; Tsukase, Masaaki; and Taguchi, Toshiki, 5,066,577, Cl. 430-562.000.
Tsukaya, Takashi: *See*—
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.
Tsukidate, Yoshitaka: *See*—
Inoue, Makoto; Miura, Hiroshi; Niita, Kaneaki; Sano, Toshiyuki; Tsukidate, Yoshitaka; and Miyazaki, Takahiro, 5,066,539, Cl. 428-328.000.
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Tsukiyama, Noriyuki: *See*—
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Tsunezawa, Masayoshi: *See*—
Ueda, Tetuyuki; and Tsunezawa, Masayoshi, 5,066,897, Cl. 318-135.000.
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Nakajima, Yoshihiro; Saito, Mitsuru; Hayashi, Tsutomu; Tsunoda, Tadashi; Yamazaki, Katsumi; Yoshida, Yoshihiro; and Nakamura, Kazuhiko, 5,065,578, Cl. 60-464.000.
Tsuruda, Mineo: *See*—
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Tsuruta, Hitoshi; Yamada, Hideaki; and Nakamura, Michihiro, to Kuraray Co., Ltd. Method and apparatus for the measurement of analyte substances. 5,066,582, Cl. 435-7.100.
Turney, William J.: *See*—
Gailus, Paul H.; Yester, Francis R.; and Turney, William J., 5,066,923, Cl. 330-107.000.
Tyler, Ralph J.: *See*—
Lukey, Christopher A.; Maitra, Ashit M.; and Tyler, Ralph J., 5,066,629, Cl. 502-84.000.
U-Line Corporation: *See*—
Byczynski, Dean G.; and Reed, William A., 5,065,584, Cl. 62-81.000.
Ube Industries, Ltd.: *See*—
Fukuzawa, Shigeo; Kaneko, Takahide; and Fujimura, Masaaki, 5,066,217, Cl. 425-589.000.
Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,066,105, Cl. 359-58.000.
Ubel, F. Andrew, III: *See*—
Oxman, Joel D.; and Ubel, F. Andrew, III, 5,066,231, Cl. 433-214.000.
Uchida, Naoto: *See*—
Yamaguchi, Shuichiro; Shimomura, Takeshi; Uchida, Naoto; Katsube, Teruaki; and Oyama, Noboru, 5,066,383, Cl. 204-435.000.
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, to Olympus Optical Co. Ltd. Extracoporeal ultrasonic lithotripter with a variable focus. 5,065,741, Cl. 128-24.0EL.
Uchiyama, Shigeru; and Murata, Yoshiyuki, to Casio Computer Co., Ltd. Apparatus for detecting the positions where strings are operated, and electronic musical instruments provided therewith. 5,065,659, Cl. 84-723.000.
Udell, Theodore H., to Container Corporation of America. Tamper evident closure. 5,065,883, Cl. 220-276.000.
Ueda, Tetuyuki; and Tsunezawa, Masayoshi, to Sharp Kabushiki Kaisha. Linear driving apparatus. 5,066,897, Cl. 318-135.000.
Ueki, Satoshi: *See*—
Doi, Yoshiharu; Ueki, Satoshi; and Furuhashi, Hiroyuki, 5,066,754, Cl. 526-336.000.
Ueno, Isamu: *See*—
Leites, Iosif L.; Karpova, Yulya G.; Berchenko, Vladimir M.; Hihara, Takeshi; Shimizu, Toshimitsu; Takahashi, Norio; and Ueno, Isamu, 5,066,314, Cl. 55-44.000.
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Felder, Ernest; Musu, Carlo; Fumagalli, Luciano; and Uggeri, Fulvio, 5,066,823, Cl. 560-13.000.
Ulrich, Hannsjorg: *See*—
Dany, Franz-Josef; Ulrich, Hannsjorg; and Westermann, Lothar, 5,066,415, Cl. 252-135.000.
Ultrafibre, Inc.: *See*—
Huykman, William, 5,066,538, Cl. 428-288.000.
Umebayashi, Masanori: *See*—
Nakamachi, Fumihiko; and Umebayashi, Masanori, 5,066,525, Cl. 428-29.000.
Umemoto, Hirotoshi: *See*—
Ohsugi, Hiroharu; Kanakura, Akihiro; Umemoto, Hirotoshi; Okamura, Yoshio; Takarada, Mitsuhiro; and Yamamoto, Kenji, 5,066,720, Cl. 525-100.000.
Umemoto, Teruo; and Ishihara, Sumi, to Sagami Chemical Research Center. Perfluoroalkyl-containing compound. 5,066,795, Cl. 540-1.000.
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Suzuki, Takao; Noda, Atsuhito; Komoto, Mitsuo; and Umesato, Shoji, 5,065,941, Cl. 439-264.000.
Umeyama, Mitsuhiro: *See*—
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Unilever Patent Holdings B.V.: *See*—
Lewis, Ian D., 5,066,712, Cl. 524-563.000.
Sherrington, David C.; and Small, Philip W., 5,066,784, Cl. 530-334.000.
Union Broach: *See*—
Speiser, Robert D.; Bernstein, Steven; Miller, Charles N.; and Shearer, Dane, 5,065,549, Cl. 51-288.000.
Union Camp Corporation: *See*—
Bardasz, Ewa A., 5,066,461, Cl. 422-16.000.
Union Carbide Chemicals and Plastics Technology Corporation: *See*—
Cole, Thomas A.; and Nielsen, Kenneth A., 5,066,522, Cl. 427-422.000.
Union Carbide Industrial Gases Technology Corporation: *See*—
Cheung, Steven D., 5,065,794, Cl. 137-883.000.
Union Industrial y Agro-Ganadera, S. A. (UNIASA): *See*—
Gil, Angel H.; Morales, Daniel V.; and Valverde, Eduardo R., 5,066,500, Cl. 426-72.000.
Unisys Corp.: *See*—
Ananth, Raju S.; and Verdone, Michael A., 5,067,037, Cl. 360-103.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for United Kingdom Atomic Energy Authority in Her Britannic Majesty's Government of the: *See*—
Heppenstall, Neil G.; Betts, Colin; and Ford, James, 5,066,453, Cl. 376-352.000.
United States of America

Air Force: *See*—
Evers, Robert C.; and Dotrong, My, 5,066,769, Cl. 528-337.000.
Army: *See*—
Stubstad, John M.; and Rand, John H., 5,065,958, Cl. 244-17.170.
Commerce: *See*—
Dutta, Binay K.; and Sikdar, Subhas K., 5,066,403, Cl. 210-638.000.
Energy: *See*—
LeMay, James D., 5,066,684, Cl. 521-64.000.
Martinez, Robert J.; and Rye, Robert R., 5,066,565, Cl. 430-296.000.
Health and Human Services: *See*—
Robey, Frank A.; Fields, Raymond L.; and Lindner, Wolfgang, 5,066,716, Cl. 525-54.100.
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Neville, David M., Jr.; and Srinivasachar, Kasturi, 5,066,490, Cl. 424-85.910.
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Bhandari, Pradeep; and Fujita, Toshio, 5,066,337, Cl. 136-202.000.
Connell, John W.; and Hergenrother, Paul M., 5,066,811, Cl. 548-119.000.
Juday, Richard D.; and Sampsell, Jeffrey B., 5,067,019, Cl. 358-160.000.
Nagasubramanian, Ganesan; DiStefano, Salvador; and Liang, Ranty H., 5,066,748, Cl. 526-258.000.
Philipp, Warren H., 5,066,625, Cl. 501-127.000.
Navy: *See*—
Bryant, Paul T.; Weller, Joseph F.; and Goldberg, Lew, 5,066,148, Cl. 385-24.000.
Dixon, David S.; and Masi, James V., 5,066,424, Cl. 252-518.000.
Koerner, Steve J., 5,066,952, Cl. 341-138.000.
Moody, Paul E., 5,065,688, Cl. 114-238.000.
Reedy, Ronald E.; Garcia, Graham A.; and Lagnado, Isaac, 5,066,613, Cl. 437-200.000.
U.S. Philips Corp.: *See*—
Angenent, Johannes; and Cavailles, Jean A., 5,066,086, Cl. 385-41.000.
Betrabet, Hemant S.; Boser, Otmar H.; Kane, Robert H.; McGee, Susan; and Caulfield, Thomas, 5,066,544, Cl. 428-614.000.
Durr, Heinrich; Rosenthal, Manfred; and Adamek, Manfred, 5,066,151, Cl. 400-605.000.
Einhaus, Hermanus F., 5,067,121, Cl. 369-75.200.
Killat, Ulrich; and Kruger, Johann, 5,067,124, Cl. 370-60.000.
Kuchar, Franz, 5,067,030, Cl. 360-14.100.
McGee, Philip J. L., 5,067,122, Cl. 369-116.000.
Oomen, Emmanuel W. J. L., 5,067,134, Cl. 372-6.000.
Van Der Marel, Cornelis; and Smoorenburg, Arnoldus D. J., 5,066,888, Cl. 313-564.000.
Van Rens, Antonia C.; Dijkmans, Eise C.; and Stikvoort, Eduard F., 5,067,138, Cl. 375-81.000.
United Technologies Automotive: *See*—
Lau, Daniel, 5,066,941, Cl. 340-457.000.
United Technologies Corporation: *See*—
Brienza, Michael J., 5,066,133, Cl. 359-570.000.
Unitika Limited: *See*—
Nishikawa, Kinsaku; Yokoyama, Hiroshi; and Takahashi, Masami, 5,066,439, Cl. 264-103.000.
Unitrode Corporation: *See*—
Neidorff, Robert A., 5,066,869, Cl. 307-272.300.
Univ. of California, The Regents of the: *See*—
Hawthorne, M. Frederick, 5,066,479, Cl. 424-1.100.
University of Akron, The: *See*—
Kennedy, Joseph P.; and Mishra, Munmaya K., 5,066,730, Cl. 525-319.000.
University of Arkansas, The: *See*—
Sheng, Zhengzhi; and Hermann, Allen M., 5,066,635, Cl. 505-1.000.
University of Birmingham: *See*—
Skinner, Gordon R. B.; and Buchan, Alexander, 5,066,492, Cl. 424-89.000.
University of British Columbia, The: *See*—
Evans, Robert L., 5,065,715, Cl. 123-263.000.
University of California, The Regents of the: *See*—
Wikman-Coffelt, Joan, 5,066,578, Cl. 435-1.000.
University of Iowa Research Foundation: *See*—
Quinn, Daniel M., 5,066,674, Cl. 514-529.000.
University of Michigan, The Regents of the: *See*—
Koren, Yoram; and Weinstein, Yechiel, 5,065,640, Cl. 74-469.000.
University of Okla., Board of Regents of the: *See*—
Ferretti, Joseph J.; and Malke, Horst, 5,066,589, Cl. 435-172.300.
University of South Florida: *See*—
Bercu, Barry B., 5,065,747, Cl. 128-630.000.
Bercu, Barry B., 5,065,748, Cl. 128-630.000.
Unruh, Gary R.: *See*—
Boutet, John C.; and Unruh, Gary R., 5,065,866, Cl. 206-455.000.
Unsmoke Systems, Inc.: *See*—
Zlotnik, Clifford, 5,066,328, Cl. 106-18.320.
Upjohn Company, The: *See*—
Jones, Lawrence D.; Frey, Paul T.; Gleason, David D.; Chee, Paula P.; and Slightom, Jerry L., 5,066,587, Cl. 435-172.100.
Urano, Satoshi: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Urano, Satoshi; Furukawa, Masamichi; Takagawa, Ryozo; Eguchi, Yoshio; and Endo, Takeshi, 5,066,722, Cl. 525-162.000.
Urata, Kazumoto: *See*—
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.
Urbach, Brian A., to TRW Inc. Ball joint with integral seal. 5,066,159, Cl. 403-134.000.
Usami, Mitsuo: *See*—
Otsuka, Kanji; Kato, Masao; Kumagai, Takashi; Usami, Mitsuo; Kuroda, Shigeo; Sahara, Kunizo; Yamada, Takeo; Miyamoto, Seiji; Shirai, Yuuji; Okinaga, Takayuki; Kubo, Kazutoshi; Tachi, Hiroshi; and Kawashima, Masayuki, 5,067,007, Cl. 357-74.000.
Usui, Junichi; and Tanizawa, Hideichi, to Daifuku Co., Ltd. Transporting train travel control system. 5,065,963, Cl. 246-187.00B.
Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
Morofushi, Kunitoshi, 5,066,196, Cl. 416-241.00A.
Vaha, Pentti: *See*—
Lindholm, Mikko; and Vaha, Pentti, 5,067,013, Cl. 358-93.000.
Valavaara, William K. Rotary device. 5,066,207, Cl. 418-171.000.
Valeo: *See*—
Bertin, Patrice; and Pankowiak, Christian, 5,065,850, Cl. 192-90.000.
Valverde, Eduardo R.: *See*—
Gil, Angel H.; Morales, Daniel V.; and Valverde, Eduardo R., 5,066,500, Cl. 426-72.000.
Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Asbeck, Lutz S.; and Segers, Jacobus C., 5,066,504, Cl. 426-417.000.
Van Dorn Company: *See*—
Gallagher, Thomas A., 5,065,888, Cl. 220-355.000.
Vance, Gary L.: *See*—
Rope, Eugene L.; Stewart, Dary R.; Tricoles, Gus P.; Vance, Gary L.; Roussos, Jonathan; and Luoma, Roy S., 5,066,921, Cl. 324-639.000.
Van Dam, David J. Laryngoscope blade sheath. 5,065,738, Cl. 128-11.000.
van den Hoven, Martinus M. G. M.; and Ermens, Hermanus W. A., to DMV Campina B.V. Storage stable liqueur or alcohol-containing beverage containing medium chain triglycerides. 5,066,509, Cl. 426-592.000.
VanderBurgh, Steven D.: *See*—
Alvarez, Robert J.; Martineau, Tom N.; and VanderBurgh, Steven D., 5,065,817, Cl. 165-153.000.
Van Der Marel, Cornelis; and Smoorenburg, Arnoldus D. J., to U.S. Philips Corporation. Alkali metal vapor dispenser. 5,066,888, Cl. 313-564.000.
van der Veen, Johannes S.: *See*—
Begemann, Malcolm J. S.; de Vries, Bernhard; and van der Veen, Johannes S., 5,065,759, Cl. 128-419.0PG.
Van Deursen, Josephus H.; Van Doorn, Johannes A.; Drent, Eit; and Wong, Pui K., to Shell Oil Company. Carbon monoxide/cyclopenten copolymer and preparation with aromatic dinitro compound. 5,066,778, Cl. 528-392.000.
Van Doorn, Johannes A.: *See*—
Van Deursen, Josephus H.; Van Doorn, Johannes A.; Drent, Eit; and Wong, Pui K., 5,066,778, Cl. 528-392.000.
Van Egmond, Cornelis F. H., to Shell Oil Company. Subterranean heaters. 5,065,818, Cl. 166-60.000.
Van Elst, Jan T.: *See*—
Narula, Anubhav P. S.; De Virgilio, John J.; and Van Elst, Jan T., 5,066,641, Cl. 512-25.000.
Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., to Shell Oil Company. Polymerization of co/olefin with diphosphine/hydrocarbyl palladium salt complex catalyst. 5,066,777, Cl. 528-392.000.
Van Rens, Antonia C.; Dijkmans, Eise C.; and Stikvoort, Eduard F., to U.S. Philips Corporation. Phase-locked-loop circuit and bit-detection arrangement comprising such a phase-locked-loop circuit. 5,067,138, Cl. 375-81.000.
Van Ryne, Randall E.: *See*—
McGraw, Thomas C.; Van Ryne, Randall E.; Scarlata, Richard F.; and Sze, Cho Y., 5,065,996, Cl. 271-176.000.
Van Vooren, Charles R.; and Austin, Leslie W. Wheel chair cycle apparatus. 5,066,032, Cl. 280-304.100.
van Wijngaarden, Ineke: *See*—
Hamminga, Derk; van Wijngaarden, Ineke; and Jansen, Johannes W. C. M., 5,066,649, Cl. 514-183.000.
Vario, Fred F. Water line test cap. 5,065,981, Cl. 251-148.000.
Vaughan, Philip A.: *See*—
McManigal, Paul G.; and Vaughan, Philip A., 5,065,788, Cl. 137-505.180.
Vaughan, Robert A.: *See*—
Larsen, Douglas C.; and Vaughan, Robert A., 5,065,562, Cl. 52-772.000.
Vavrek, Robert M.; and McFarland, Thomas G., to General Electric Company. Gradient amplifier system with flexible amplifier allocation. 5,066,914, Cl. 324-309.000.
Vedamuthu, Ebenezer R., to Microlife Technics, Inc. *Streptococcus Lactis* containing plasmids encoding for mucoidness and method for identifying such strains. 5,066,588, Cl. 435-172.300.
Veenstra, Steven E. Wind direction indicator. 5,065,622, Cl. 73-188.000.
Vega, Luis F.: *See*—
Andreshak, Joseph C.; Datta, Madhav; Romankiw, Lubomyr T.; and Vega, Luis F., 5,066,370, Cl. 204-129.100.
Vehmas, Jukka H.: *See*—
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Vehrens, Peter: *See*—
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Vella-Coleiro, George P.: *See*—
Gordon, Alexander; and Vella-Coleiro, George P., 5,067,173, Cl. 359-152.000.

Velnosky, James C.: *See*—
Karkar, Maurice N.; and Velnosky, James C., 5,066,859, Cl. 250-339.000.

Verdone, Michael A.: *See*—
Ananth, Raju S.; and Verdone, Michael A., 5,067,037, Cl. 360-103.000.

Verdun, Gary J., to Compaq Computer Corporation. High density electrical connector with electrostatic discharge protection. 5,066,240, Cl. 439-181.000.

Vereinigte Aluminium-Werke Aktiengesellschaft: *See*—
Ostermann, Friedrich; Plath, Hans-Heinrich; and Griep, Winfried, 5,065,510, Cl. 29-894.324.

Verhagen, George: *See*—
Harry, John O.; Verhagen, George; and Small, Rudy E., 5,066,379, Cl. 204-279.000.

Vezina, Claude: *See*—
Sehgal, Surendra N.; and Vezina, Claude, 5,066,493, Cl. 424-122.000.

Vick, Henry L. Cigarette lighter. 5,066,220, Cl. 431-277.000.

Vidusek, Daniel A.; and White, Justin D., to Spraying Systems Co. Multiple head spray nozzle assembly with common supply manifold. 5,065,945, Cl. 239-556.000.

Vincent, Alex. Lathe attachment duplicating device. 5,065,801, Cl. 142-38.000.

Vipont Pharmaceutical, Inc.: *See*—
Harkrader, Ronald J.; Jones, Richard R.; and Peterson, Kenneth S., 5,066,483, Cl. 424-54.000.

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Glasser, Wolfgang G.; De Oliveira, Willer; Kelley, Stephen S.; and Nieh, Li S., 5,066,790, Cl. 530-502.000.

Virginia Tech Intellectual Properties, Inc.: *See*—
Gibson, Harry W.; and Jois, Yajnanarayana H. R., 5,066,773, Cl. 528-362.000.

VISystems, Inc.: *See*—
Talati, Kirit K.; and Lackie, C. Willard, 5,067,072, Cl. 395-650.000.

Vitale, Stefano: *See*—
Cerdonio, Massimo; and Vitale, Stefano, 5,066,637, Cl. 501-1.000.

Vitatron Medical B.V.: *See*—
Begemann, Malcolm J. S.; de Vries, Bernhard; and van der Veen, Johannes S., 5,065,759, Cl. 128-419.0PG.

Vogel, Allen J.: *See*—
Schuh, Robert R.; Terrell, Nancy E.; Kreiseder, Walter J.; and Vogel, Allen J., 5,065,887, Cl. 220-338.000.

Volker, Helmut: *See*—
Muller, Heinz-Joachim; Sluma, Heinz-Dieter; Eberhard, Gunter; Spindler, Ernst; Krauss, Lothar; and Volker, Helmut, 5,066,401, Cl. 210-500.350.

Volkert, Wynn A.: *See*—
Simon, Jaime; Wilson, David A.; Volkert, Wynn A.; Troutner, David E.; and Goeckeler, William F., 5,066,478, Cl. 424-1.100.

von Eckardstein, Karl-Ernst: *See*—
Coja, Joachim; von Eckardstein, Karl-Ernst; and Simnovec, Andrej, 5,066,203, Cl. 417-318.000.

Von Haas, Rainer; and Tack, Hans, to Krupp Widia GmbH. Method of and assembly for releasably connecting a tool head to a tool base holder of a tool turret machine tool. 5,065,492, Cl. 29-426.600.

Voorheis, Scott D.: *See*—
Rhodes, Keith J.; and Voorheis, Scott D., 5,066,390, Cl. 209-217.000.

Vorberg, Dieter: *See*—
Berges, Hanns-Peter; Fischer, Berthold; Mueller, Peter; and Vorberg, Dieter, 5,066,202, Cl. 417-228.000.

Vos, David J.: *See*—
Vos, Peter M.; and Vos, David J., 5,066,505, Cl. 426-438.000.

Vos Fry Systems Australia Ltd.: *See*—
Vos, Peter M.; and Vos, David J., 5,066,505, Cl. 426-438.000.

Vos, Peter M.; and Vos, David J., to Vos Fry Systems Australia Ltd. Cooking method and apparatus. 5,066,505, Cl. 426-438.000.

Voss, Erdmuthe; Moschinsky, Werner; and Hofmann-Moritz, Doris, to Consortium fur elektrochemische Industrie GmbH. Phenylethl o-methylcinnamate, a process for preparation and a fragrance composition containing same. 5,066,640, Cl. 512-21.000.

Voss, Mark G.: *See*—
Powell, James W.; Voss, Mark G.; and Waineo, Bryan N., 5,065,590, Cl. 62-175.000.

Vranesic, Branka; Tomasic, Jelka; Smerdel, Stanislav; Kantoci, Darko; Sava, Gianni; and Hrsak, Ivo, to Imunoloski Zavod. Adamantyl comprising tripeptides, derivatives and hydrochlorides thereof, their preparation and use. 5,066,642, Cl. 514-18.000.

Vratsanos, Menas S.: *See*—
Casey, Jeremiah P.; Lucas, Peter A.; and Vratsanos, Menas S., 5,066,764, Cl. 528-122.000.

Vrudhula, Vivekananda M.: *See*—
Sivam, Gowsala P.; Reed, Michael W.; Srinivasan, Ananthachari; Morgan, A. Charles, Jr.; Brixner, Diana I.; Vrudhula, Vivekananda M.; and Comezoglu, F. Taha, 5,066,789, Cl. 530-388.000.

VSL International AG: *See*—
Siegfried, Erwin; and Marti, Peter, 5,066,167, Cl. 405-150.100.

Vyve, Albert V.: *See*—
Deacon, Walter T.; and Vyve, Albert V., 5,065,785, Cl. 137-185.000.

W. A. Whitney Corp.: *See*—
Cowan, Louis G.; and Cardey, Dale L., 5,065,654, Cl. 83-255.000.

W. H. Brady Co.: *See*—
Perko, Jack E.; Wirth, Gary J.; and Foxgrover, Brian A., 5,066,349, Cl. 156-166.000.

W. R. Grace & Co.-Conn.: *See*—
—O'Rell, Dennis; Hamed, Parviz; and DiPerna, Thomas C., 5,066,537, Cl. 428-246.000.

Wacker Silicones Corporation: *See*—
Hart, George M.; and Hayford, Mark E., 5,066,703, Cl. 524-437.000.

Wada, Keiichiro; Cassidy, Patrick E.; and Hager, William S., to Nippon Steel Chemical Co., Ltd. Poly(azomethine-ester) having film-forming ability, and heat resistance pre and regulated monomer sequences in the polymer backbone. 5,066,765, Cl. 528-185.000.

Wada, Shunichi, to Mitsubishi Denki K.K. Ultrasonic obstacle sensor. 5,067,115, Cl. 367-99.000.

Wadaka, Shusou: *See*—
Koike, Mitsuhiro; and Wadaka, Shusou, 5,065,629, Cl. 73-602.000.

Wade, Gerald T., to Hewlett-Packard Company. Continuous computer performance measurement tool that reduces operating system produced performance data for logging into global, process, and workload files. 5,067,107, Cl. 395-500.000.

Wagner, Allen J.: *See*—
Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., 5,067,002, Cl. 357-59.000.

Wahl, Seymour; and Spector, George. Apparatus for evenly dispensing melted butter. 5,065,927, Cl. 222-185.000.

Waineo, Bryan N.: *See*—
Powell, James W.; Voss, Mark G.; and Waineo, Bryan N., 5,065,590, Cl. 62-175.000.

Wakahara, Kaoru: *See*—
Kagiyama, Junji; Kobayashi, Kiyonori; Nakane, Mototaka; Kamiya, Masakazu; Umeyama, Mitsuhiro; Inui, Masaki; Wakahara, Kaoru; and Hosono, Masaki, 5,065,642, Cl. 74-574.000.

Wakamiya, Wataru: *See*—
Eimori, Takahisa; Satoh, Shinichi; Wakamiya, Wataru; Ozaki, Hiroji; and Tanaka, Yoshinori, 5,067,000, Cl. 357-53.000.

Wakamori, Takehisa; Ogawa, Takashi; Ito, Ryoji; and Shimanaka, Chikafumi, to Honda Giken Kogyo Kabushiki Kaisha. Method for installing bearings on engine components. 5,065,507, Cl. 29-888.010.

Wakimoto, Yasuhiro; and Suzuki, Tetsuo, to Fujitsu Limited. Single chip microcomputer having unauthorized memory space access protection. 5,067,077, Cl. 395-400.000.

Wakita, Naomasa: *See*—
Ito, Kenji; Shimizu, Hiroyuki; and Wakita, Naomasa, 5,066,934, Cl. 333-205.000.

Wakui, Tetsuya, to Canon Kabushiki Kaisha. Rotation control device using reproduced synchronizing signal. 5,067,033, Cl. 360-70.000.

Waldrop, John L.; and Glover, Clarence B., to Honeywell Inc. Magnetic field measurement and compass calibration in areas of magnetic disturbance. 5,065,521, Cl. 33-361.000.

Walker, Kevin E., to AMP Incorporated. Retention device for flat pack sockets. 5,066,245, Cl. 439-526.000.

Walker, Louis L.; and Larson, Paul A., to Dow Chemical Company, The. Curable composition containing a difunctional epoxy resin, a polyfunctional epoxy resin, a difunctional phenol and a polyfunctional phenol. 5,066,735, Cl. 525-482.000.

Walkhoff, Klaus, to Raichle Sportschuh AG. Clamping device for a ski boot. 5,065,481, Cl. 24-68.0SK.

Wall, Alan; Grayson, Peter; and Egerton, Michael, to Harold Watson Limited. Attachment device. 5,066,162, Cl. 403-361.000.

Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Dajih; and Hawryszkow, Michael G., to Westinghouse Air Brake Company. Articulated coupling apparatus for connecting adjacent ends of a pair of railway cars together in a semipermanent manner. 5,065,679, Cl. 105-3.000.

Walley, Darlene R.; Buttery, Howard J.; Norbury, Robert J.; Schmidt, Diane G.; and Michael, William R., to Procter & Gamble Company, The; and Minnesota Mining & Manufacturing Co. Coated perfume particles. 5,066,419, Cl. 252-174.110.

Walsh, Daniel R., to Polyonics Corporation. Process for forming polyimide-metal laminates. 5,066,545, Cl. 428-626.000.

Walter, Gerhard: *See*—
Langowski, Andreas; Schultz, Wolfgang; and Walter, Gerhard, 5,065,524, Cl. 33-544.200.

Walter, Jurgen: *See*—
Lunke, Manfred; Falz, Ulrich; and Walter, Jurgen, 5,066,263, Cl. 464-96.000.

Walther, Klaus: *See*—
Reisinger, Lothar; Hagg, Dieter; Wenzl, Werner; and Walther, Klaus, 5,066,024, Cl. 277-53.000.

Wanat, Robert A.: *See*—
Bortnick, Newman M.; Wanat, Robert A.; and Degraff, Darnel, 5,066,696, Cl. 524-91.000.

Wang, Carl C. T., to Alcon Laboratories, Inc. Method and apparatus for injecting viscous fluid into the eye to lift pre-retinal and post-retinal membrane with linear pressure control. 5,066,276, Cl. 604-51.000.

Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., to Abbott Laboratories. Fluorescence polarization immunoassay utilizing substituted carboxyfluoresceins. 5,066,426, Cl. 540-106.000.

Wang, Jinn-Shyan, to Industrial Technology Research Institute. Progressive scan system with field-offset sampling. 5,067,016, Cl. 358-140.000.

Wang, Shein S.: *See*—
Hanson, Douglas W.; Wang, Shein S.; and Harlan, William S., 5,067,113, Cl. 367-50.000.

Wang, Wang-Nang: *See—*
Liu, Ru-Shi; Wang, Wang-Nang; and Chang, Chan-Ting, 5,066,636, Cl. 505-1.000.

Wang, Yeong-Jing. Smooth surface fixing setter. 5,065,973, Cl. 248-362.000.

Wanner, Edward A.; and Widge, Sunil, to Carpenter Technology Corporation. Heat resisting controlled thermal expansion alloy balanced for having globular intermetallic phase. 5,066,458, Cl. 420-586.000.

Ward, Robert B., Sr. Buoy and releasing system for ships in distress. 5,066,256, Cl. 441-7.000.

Ward-Smith, Alfred J.: *See—*
Davey, Rodney J.; Handley, Graham R.; and Ward-Smith, Alfred J., 5,065,928, Cl. 226-7.000.

Warmerdam, Gerard G. Pipe joint testing and grouting unit. 5,066,208, Cl. 425-13.000.

Warner-Lambert Co.: *See—*
Boschelli, Diane H.; Connor, David T.; Flynn, Daniel L.; Sircar, Jagadish C.; and Hoefle, Milton L., 5,066,668, Cl. 514-384.000.
Cherukuri, Subraman R.; Raman, Kirschna P.; Wong, Lucy L.; Mansukhani, Gul; and Orama, Angel, 5,066,511, Cl. 426-658.000.
Hobbs, Sheila H.; and Johnson, Stephen J., 5,066,662, Cl. 514-364.000.
Hobbs, Sheila H., 5,066,663, Cl. 514-326.000.
Hobbs, Sheila H., 5,066,665, Cl. 514-380.000.
Iderosa, Richard A., 5,065,515, Cl. 30-140.000.

Waseda University: *See—*
Miwa, Yoshiyuki; Kodama, Hiroshi; Murase, Takuya; Shikae, Sadao; Nakagawa, Masaya; and Kabumoto, Tsutomu, 5,066,507, Cl. 426-481.000.

Wasserman, Christopher: *See—*
Steine, Hans-Theo; and Wasserman, Christopher, 5,066,523, Cl. 427-423.000.

Wasthuber, Robert: *See—*
Lengenfelder, Hans; and Wasthuber, Robert, 5,066,953, Cl. 341-155.000.

Watanabe, Atsushi, to Fanuc Ltd. Automatic nominal data setting method in a visual sensor system. 5,066,902, Cl. 318-568.160.

Watanabe, Hiroshi: *See—*
Kato, Tetsuo; Fukuda, Kiyohito; Watanabe, Hiroshi; Terada, Katsuaki; and Taguchi, Naoto, 5,066,252, Cl. 439-752.000.

Watanabe, Kiyomi; and Matsumoto, Tetsuya, to Origin Electric Co., Ltd. Current detecting circuit for X-ray tube. 5,067,143, Cl. 378-110.000.

Watanabe, Kohei: *See—*
Muto, Yoshihiko; Watanabe, Kohei; Yasukata, Koichi; and Sakurai, Tomoyuki, 5,066,397, Cl. 210-321.610.

Watanabe, Nobuhiko: *See—*
Uchiyama, Naoki; Tsukaya, Takashi; Ishihara, Kouichiro; Takehana, Sakae; Kubota, Tetsumaru; Takayama, Syuichi; Taniguchi, Akira; Watanabe, Nobuhiko; Sekino, Naomi; Hibino, Hiroki; and Hayashi, Masaaki, 5,065,741, Cl. 128-24.0EL.

Watanabe, Osamu: *See—*
Yoshida, Masayuki; Yoshio, Junichi; and Watanabe, Osamu, 5,067,119, Cl. 369-47.000.

Watanabe, Tatsuo: *See—*
Mizuno, Toshio; Muratani, Takuro; Ito, Yasuhiko; Watanabe, Tatsuo; and Inoue, Takashi, 5,066,957, Cl. 342-352.000.

Watarai, Shinichi; Yasuda, Megumi; Houki, Yoji; and Nishio, Yukio, to Fujitsu Limited. Image forming apparatus having an exchangeable unit exchange timing indicating device. 5,066,978, Cl. 355-206.000.

Waters, John H.: *See—*
Dean, William R.; and Waters, John H., 5,066,019, Cl. 273-348.100.

Wathen, Ronald L.: *See—*
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,065,791, Cl. 137-515.000.

Watson, James A.: *See—*
Chan, Yiu-Fai; Hsiao, Chang-Chia; and Watson, James A., 5,066,873, Cl. 307-443.000.

Watson, James F. Electrical fitting for panel construction. 5,066,247, Cl. 439-565.000.

Watson, John G.: *See—*
Driscoll, Edward C., Jr.; Martin, Craig O.; Ruby, Kenneth; Russell, James J.; and Watson, John G., 5,067,162, Cl. 382-5.000.

Watt, Allan. Handle attachment for an implement having an elongate handle shaft. 5,065,475, Cl. 16-114.00R.

Wedel, Gregory L.: *See—*
Skaugen, Borgeir; and Wedel, Gregory L., 5,065,529, Cl. 34-117.000.

Wedell, Anders S. Spring for compression and tension, mainly in axial direction. 5,065,988, Cl. 267-149.000.

Weetall, Howard H., to Ciba Corning Diagnostics Corp. Unitary multiple electrode sensor. 5,066,372, Cl. 204-153.100.

Wehle, Anton; Hoppner, Klaus; and Weiss, Hermann, to Andreas Stihl. Internal combustion engine for a portable handheld work apparatus. 5,065,708, Cl. 123-52.0MC.

Wehnert, Wolfgang; Reinking, Klaus; Bier, Peter; Kraft, Klaus; and Tresper, Erhard, to Bayer Aktiengesellschaft. Filled thermoplasts with low shrinkage anisotropy. 5,066,704, Cl. 524-449.000.

Weigl, Jeffrey L.; and Babuder, Gerald A., to Cajon Company. Anti-twist coupling assembly with biasing means. 5,066,051, Cl. 285-328.000.

Weil, Thomas L., to Davlyn Manufacturing Co. Gasket assembly. 5,066,028, Cl. 277-181.000.

Weinberger, Scot R.; and Mills, James L., to Spectra-Physics, Inc. Thermal control for capillary electrophoresis apparatus. 5,066,382, Cl. 204-299.00R.

Weinert, Fritz K., to Titan Linkabit Corporation. Conversion of analog signal into I and Q digital signals with enhanced image rejection. 5,067,140, Cl. 375-77.000.

Weinrotter, Klaus: *See—*
Seidl, Sigrid; Weinrotter, Klaus; and Simharl, Reinhold, 5,066,760, Cl. 528-51.000.

Weinstein, Jerry G.: *See—*
Kantner, Robert C.; Rocazella, Michael A.; Weinstein, Jerry G.; and White, Danny R., 5,066,618, Cl. 501-127.000.

Weinstein, Yechiel: *See—*
Koren, Yoram; and Weinstein, Yechiel, 5,065,640, Cl. 74-469.000.

Weiss, Hermann: *See—*
Wehle, Anton; Hoppner, Klaus; and Weiss, Hermann, 5,065,708, Cl. 123-52.0MC.

Weiss, Wilhelm, to Krones AG Hermann Kronseder Maschinenfabrik. Apparatus for filling cans. 5,065,799, Cl. 141-39.000.

Weiss, Wolfgang: *See—*
Pastorek, Emmerich; Orth, Winfried; Weiss, Wolfgang; and Kleffner, Hans W., 5,066,806, Cl. 546-180.000.

Weissman, Bernard. Dental product combining a reamer tool and anchor post. 5,066,230, Cl. 433-165.000.

Weitzel, Rose M.: *See—*
Ehrman, Albert M.; Seiden, Paul; Weitzel, Rose M.; and White, Robert L., 5,066,510, Cl. 426-607.000.

Welch Allyn, Inc.: *See—*
Krauter, Allan I., 5,066,122, Cl. 356-241.000.

Weller, Joseph F.: *See—*
Bryant, Paul T.; Weller, Joseph F.; and Goldberg, Lew, 5,066,148, Cl. 385-24.000.

Welsh, David E., to ITT Corporation. Polarizing key permitting connector displacement. 5,066,250, Cl. 439-681.000.

Wendt, Hans-Jurgen: *See—*
Munster, Horst; and Wendt, Hans-Jurgen, 5,066,951, Cl. 341-32.000.

Wendt, Peter, to Siemens Aktiengesellschaft; and Siemens Aktiengesellschaft. Pulse power amplifier. 5,066,924, Cl. 330-124.00R.

Wendt, Wolfgang: *See—*
Honel, Michael; Ziegler, Peter; Sprenger, Walter; and Wendt, Wolfgang, 5,066,758, Cl. 528-45.000.

Wennerberg, Gunnar, to Measurex Corporation. Single sided reflectance sensor for measuring select physical properties of a material using one or more wavelengths of radiation. 5,066,865, Cl. 250-572.000.

Wenzel, Dennis J.; and McFalls, David S., II, to Southwest Research Institute. Optical robotic canopy polishing system. 5,067,085, Cl. 364-474.060.

Wenzl, Werner: *See—*
Reisinger, Lothar; Hagg, Dieter; Wenzl, Werner; and Walther, Klaus, 5,066,024, Cl. 277-53.000.

Werder, Jonathan C.: *See—*
Olson, David P.; and Werder, Jonathan C., 5,067,096, Cl. 364-517.000.

Werner, John A., to Toolrite Manufacturing Company. Twist-shearing apparatus. 5,065,653, Cl. 83-199.000.

Wessel, Edward O.: *See—*
Wessel, Lloyd F.; Wessel, Edward O.; and Mudd, MaryAnn, 5,065,567, Cl. 56-13.700.

Wessel, Lloyd F.; Wessel, Edward O.; and Mudd, MaryAnn. Lawn edger. 5,065,567, Cl. 56-13.700.

Westermann, Lothar: *See—*
Dany, Franz-Josef; Ulrich, Hannsjorg; and Westermann, Lothar, 5,066,415, Cl. 252-135.000.

Westinghous Electric Corp.: *See—*
—Morse, Alfred W., 5,066,930, Cl. 333-164.000.

Westinghouse Air Brake Company: *See—*
Wallace, William D.; Lynch, Edward G., Jr.; Daugherty, David W., Jr.; Kanjo, Dajih; and Hawryszkow, Michael G., 5,065,679, Cl. 105-3.000.

Westinghouse Electric Corp.: *See—*
—Burtner, Lee W.; and Chizmar, David A., 5,065,635, Cl. 73-866.500.
—Catanese, John A., 5,066,913, Cl. 324-226.000.
—Davies, David K.; Chantry, Peter J.; and Goutzoulis, Anastasios P., 5,066,088, Cl. 385-25.000.
—DeLong, Ronald B.; Persing, Brian J.; Raabe, Charles G.; Bouse, James R.; Bemis, Peter F.; Hollerbach, Eric T.; Bruggink, Bradley J.; and Cykana, Daniel, 5,065,556, Cl. 52-221.000.
—Freitag, Ronald G., 5,066,925, Cl. 330-269.000.
—Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,496, Cl. 29-599.000.
—Jarabak, Andrew J.; Sunderman, Wallace H.; Mendola, Edward G.; and Kalkbrenner, Ralph W., 5,065,497, Cl. 29-564.700.
—Mallick, George T., Jr.; Logan, James R.; and Marschik, David, 5,067,044, Cl. 361-19.000.
—Martin, Raymond G., 5,066,956, Cl. 342-154.000.
—Pirl, William E., 5,066,846, Cl. 219-121.630.
—Sargeant, John B., 5,066,882, Cl. 310-217.000.
—Tessaro, John E., 5,066,451, Cl. 376-237.000.

Westling, Gregory L.: *See—*
Critchlow, David N.; Avis, Graham M.; Earlam, Sandra J. K.; Johnson, Karle J.; Smetana, Bruce A.; Westling, Gregory L.; Paneth, Eric; and Yehushua, Moshe, 5,067,141, Cl. 375-97.000.

Westvaco Corporation: *See—*
Hutter, G. Frederick, 5,066,331, Cl. 106-30.000.

Wetherholt, Steven D.: *See*—
Harris, James E.; Farfaglia, Leonard T., deceased; and Wetherholt, Steven D., 5,065,596, Cl. 62-262.000.

Wetzel, Rolf; and Firnhaber, Bernhard, to Krupp Koppers GmbH. Method of producing hydrogen-rich gas. 5,066,476, Cl. 423-648.100.

Wheeler, Todd; and Johnson, Wayne A., to ADC Telecommunications, Inc. Splice tray with slack take-up. 5,066,149, Cl. 385-135.000.

Whirlpool Corporation: *See*—
Farfaglia, Leonard T., deceased; Campbell, Timothy J.; Gipson, Billy P.; Matambo, Thompson; and Thompson, Christoper M., 5,065,597, Cl. 62-262.000.
Harris, James E.; Farfaglia, Leonard T., deceased; and Wetherholt, Steven D., 5,065,596, Cl. 62-262.000.
Kretchman, Gerald L., 5,066,050, Cl. 285-319.000.

Whitaker, Kerry. Resilient sign and guidepost. 5,066,163, Cl. 404-10.000.

Whitby Research, Inc.: *See*—
Olsson, Ray A., 5,066,655, Cl. 514-261.000.

White, Danny R.: *See*—
Kantner, Robert C.; Rocazella, Michael A.; Weinstein, Jerry G.; and White, Danny R., 5,066,618, Cl. 501-127.000.

White, Justin D.: *See*—
Vidusek, Daniel A.; and White, Justin D., 5,065,945, Cl. 239-556.000.

White, Robert L.: *See*—
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White Storage & Retrieval Systems, Inc.: *See*—
Simon, David, 5,065,872, Cl. 211-122.000.

Whitehead, James L.; and Chapman, Leland D. Cold pack for treatment of injuries. 5,065,758, Cl. 128-402.000.

Whitehurst, Todd K.: *See*—
Green, Philip S.; Ostrem, John S.; and Whitehurst, Todd K., 5,065,763, Cl. 128-660.070.

Wickert, Frank A., to Glidden Company, The. Ambient cure protective coatings for plastic substrates. 5,066,705, Cl. 524-457.000.

Widge, Sunil: *See*—
Wanner, Edward A.; and Widge, Sunil, 5,066,458, Cl. 420-586.000.

Wiedemann, Walter: *See*—
Cseh, Georg; Lienhard, Paul; and Wiedemann, Walter, 5,066,695, Cl. 524-87.000.

Wiggins, Kregg S.; and Wright, Danny O., to Siemens Automotive L.P. Power supply circuit for dual throttle position sensors of an electronic engine throttle control. 5,065,721, Cl. 123-399.000.

Wijay, Bandula; and Angelini, Paolo, to Leocor, Inc. Positive displacement piston driven blood pump. 5,066,282, Cl. 604-152.000.

Wikman-Coffelt, Joan, to University of California, The Regents of the. Long-term preservation of organs for transplantation. 5,066,578, Cl. 435-1.000.

Wiktor, Dominik M.; and Schlindwein, Siegfried, to Automatic Switch Company. Manual operator for an electrical switch. 5,066,840, Cl. 200-330.000.

Wilcox, Allen. Water Monitor. 5,065,623, Cl. 73-290.00R.

Wilcox, Milton E., to National Semiconductor Corporation. Maximum swing cascode circuit for a bipolar charge pump. 5,066,871, Cl. 307-296.100.

Wild Leitz GmbH: *See*—
Pfeifer, Gerhard, 5,065,657, Cl. 83-703.000.

Wiley, Robert G. Variable focus lens. 5,066,301, Cl. 623-6.000.

Wilhelm, H. Randall: *See*—
Heck, John A.; and Wilhelm, H. Randall, 5,066,026, Cl. 277-96.100.

Wilke, Dorothea: *See*—
Meinel, Fred; and Wilke, Dorothea, 5,067,146, Cl. 378-199.000.

Wilkinson, William T. Portable, foldable, adjustable, aerobic exercise bench/step/mat. 5,066,001, Cl. 272-70.000.

Willbanks, Henry O., to Teledyne Ind. Inc. Thermoplastic end seal for electric heating elements. 5,066,852, Cl. 219-544.000.

Willbe, Charles: *See*—
Skidmore, Ian F.; Lunts, Lawrence H. C.; Finch, Harry; Naylor, Alan; Campbell, Ian B.; Willbe, Charles; Mitchell, William L.; Swanson, Stephen; and Judkins, Brian D., 5,066,678, Cl. 514-597.000.

Willcox, Kenneth W., to Phillips Petroleum Company. Corrosion inhibition of polymethylpentene. 5,066,460, Cl. 422-7.000.

Willcox, Kenneth W.: *See*—
Fodor, Lawrence M.; and Willcox, Kenneth W., 5,066,686, Cl. 523-102.000.

Wille, Klaus; Kienberger, Helmut; and Marwitz, Erika, to Siemens Aktiengesellschaft. Method for transmitting subscriber data in communication systems from one secret subscriber equipment to another. 5,067,153, Cl. 380-23.000.

Williams, George W.; and Rifkin, Arnold S., to A. Rifkin Co. Lockable container for securing valuables. 5,065,602, Cl. 70-68.000.

Williams International Corporation: *See*—
Powell, James W.; Voss, Mark G.; and Waineo, Bryan N., 5,065,590, Cl. 62-175.000.

Williams, Stephen P.: *See*—
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Williamson, Richard: *See*—
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Willis, Wilfred E.: *See*—
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Wilson, David A.: *See*—
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Wilson, Derek E.: *See*—
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Wilton, Bonsall S.: *See*—
Bloys, James B.; and Wilton, Bonsall S., 5,065,820, Cl. 166-291.000.

Winkle, Mark R., to Rohm and Haas Company. Elimination of film defects due to hydrogen evolution during cathodic electrodeposition. 5,066,374, Cl. 204-181.400.

Wirth, Gary J.: *See*—
Perko, Jack E.; Wirth, Gary J.; and Foxgrover, Brian A., 5,066,349, Cl. 156-166.000.

Wisbey, Jerry D.: *See*—
Albers, Stephen J.; Grimshaw, Michael N.; Peterson, David A.; Pugh, John H.; and Wisbey, Jerry D., 5,066,352, Cl. 156-265.000.

Wisconsin Alumni Research Foundation: *See*—
Mueller, Gerald C., 5,066,583, Cl. 435-18.000.
Perepezko, John H.; and Hoffmeyer, Mark K., 5,066,324, Cl. 75-335.000.

Witkin, Roy T., to Jacobs, Albert L., Jr., a part interest. Antimicrobial veterinary compositions and methods. 5,066,497, Cl. 424-616.000.

Witt, Charles W.: *See*—
Meyers, John A.; Drake, David E.; and Witt, Charles W., 5,065,827, Cl. 175-414.000.

Wittmann, Dieter: *See*—
Eichenauer, Herbert; Wittmann, Dieter; Schmidt, Adolf; and Ott, Karl-Heinz, 5,066,717, Cl. 525-67.000.

Wivagg, Adrian P.; and Martin, Kenneth A., to Combustion Engineering, Inc. Threaded insert for repairing a nuclear assembly. 5,065,490, Cl. 29-402.170.

Wofford, Ray F.; and Potter, George S. Modular and componential trench drain system. 5,066,165, Cl. 405-119.000.

Wolf, Bernd: *See*—
Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, 5,066,673, Cl. 514-521.000.

Wolf, Gerald L. Method and apparatus for reversibly occluding a biological tube. 5,065,751, Cl. 128-831.000.

Wong, Lucy L.: *See*—
Cherukuri, Subraman R.; Raman, Kirschna P.; Wong, Lucy L.; Mansukhani, Gul; and Orama, Angel, 5,066,511, Cl. 426-658.000.

Wong, Pui K.: *See*—
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Van Leeuwen, Petrus W. N. M.; Roobeek, Cornelis F.; and Wong, Pui K., 5,066,777, Cl. 528-392.000.

Wong, Y. H.: *See*—
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Wood, Ruey E., to TRW Inc. Ball joint. 5,066,160, Cl. 403-140.000.

Woodard, Lloyd A.: *See*—
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Agarwal, Jagdish A.; Gannon, Richard; Goldfarb, Victor; Stickler, David; and Woodroffe, Jaime, 5,066,326, Cl. 75-581.000.

Woodruff, Eric J.: *See*—
Bark, Jeffrey E.; Hillegass, Donald V.; and Woodruff, Eric J., 5,066,303, Cl. 623-8.000.

Woodward, Bruce; and Hall, James, to National Products, Inc. Tambour door and method of making. 5,066,080, Cl. 312-297.000.

Woody, George, to Hughes Aircraft Company. Support structure. 5,065,976, Cl. 248-549.000.

Wray-Tech Instruments, Inc.: *See*—
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Smith, Ronald, 5,065,829, Cl. 177-139.000.

Wright, Danny O.: *See*—
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Wright, John: *See*—
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Omata, Satoshi; Shimizu, Hiroshi; and Yamaguchi, Yoko, 5,067,160, Cl. 382-1.000.

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Yamanaka, Satoshi: *See*—
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Omori, Katsuhisa; and Yamashita, Masaya, 5,066,915, Cl. 324-318.000.

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Yanagi, Eiichi: *See*—
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Yasuda, Hiromu: *See*—
Nakayama, Susumu; Oguni, Kensaku; Yasuda, Hiromu; Minakata, Rumi; Urata, Kazumoto; Muramatsu, Masatoshi; Tokusa, Kenji; Senshu, Takao; Terada, Hirokiyo; and Kitani, Fumihiko, 5,065,588, Cl. 62-160.000.

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Kameyama, Isao, 5,066,253, Cl. 439-752.000.
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Yeh, Ling; Harrelson, Hugh G.; and Coons, Andrew M., III, to BASF Corporation. End identifier for multidye yarn. 5,066,308, Cl. 8-403.000.
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Yonezawa, Keitaro, to Kabushiki Kaisha Kosmek. Clamping apparatus for press brake. 5,065,610, Cl. 72-462.000.
Yoshida, Hideyuki: *See*—
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Yoshida, Hirokazu, to Otari Electric Co. Ltd. Tape transport apparatus and method of introducing tape thereto. 5,066,347, Cl. 156-159.000.
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Yoshida Kogyo K. K.: *See*—
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Yoshida, Masayuki; Yoshio, Junichi; and Watanabe, Osamu, to Pioneer Electronic Corporation. Recording medium playing apparatus with automatic tonal response setting function. 5,067,119, Cl. 369-47.000.
Yoshida, Mayumi: *See*—
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Yoshida, Yoshihiro: *See*—
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Kawaguchi, Masatoshi; Tajima, Norio; Hatanaka, Setsumi; Yoshinaga, Hiroshi; Inoue, Masahiro; Nagaoka, Tadao; Okunishi, Hiromu; Kurosawa, Masaaki; Ikeda, Hideaki; Ooba, Takeshi; Matsuo, Nobuki; and Onda, Hiroshi, 5,065,810, Cl. 164-76.100.
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Young, Terry G., to Baker Hughes Incorporated. Sequence valve. 5,065,666, Cl. 91-518.000.
Young, William R.; and Rivoli, Anthony L., to Harris Corporation. Double level conductor structure. 5,066,995, Cl. 357-42.000.
Yu, Chang, to Micron Technology, Inc. Method for improving step coverage of a metallization layer on an integrated circuit by use of molybdenum as an anti-reflective coating. 5,066,611, Cl. 437-173.000.
Yu, Stanley K.: *See*—
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Zama, Hideo: *See*—
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Zammit, Robert P., to International Business Machines Corporation. Method of lapping magnetic recording heads. 5,065,483, Cl. 29-603.000.

Zaun, Richard D.: *See*—
Brett, William A.; and Zaun, Richard D., 5,066,030, Cl. 280-92.000.

Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., to Motorola, Inc. Integrated circuit structures having polycrystalline electrode contacts. 5,067,002, Cl. 357-59.000.

Zegel, Douglas R.; Jensen, Gary S.; Hernick, Mark R.; and Daniels, Michael J., to Art Guild, Inc. Wall system and method of construction. 5,065,559, Cl. 52-239.000.

Zelinka, Richard L.: *See*—
Rocklitz, Gary J.; Crofoot, Douglas G.; and Zelinka, Richard L., 5,066,400, Cl. 210-493.500.

Zell, Michael S.; and Frodette, Maurice C. J., to Tenneco Canada Inc. Production of chlorine dioxide. 5,066,477, Cl. 423-479.000.

Zerr, Ronald D.: *See*—
Hake, Leon M.; and Zerr, Ronald D., 5,065,984, Cl. 254-18.000.

Zertani, Rudolf; Mohr, Dieter; and Rode, Klaus, to Hoechst Aktiengesellschaft. Photopolymerizable mixture and recording material produced therefrom. 5,066,564, Cl. 430-284.000.

Zexel Corporation: *See*—
Otsuka, Masuhiro; and Kono, Hiromi, 5,065,851, Cl. 192-103.00R.

Ziegelmeyer, Lynn J. Cutter link. 5,065,658, Cl. 83-834.000.

Ziegler, Elmar, to Siemens Aktiengesellschaft. Heating or air conditioning control device for a motor vehicle. 5,065,667, Cl. 98-2.000.

Ziegler III, Philip L.: *See*—
Egbert, Gary L.; and Ziegler III, Philip L., 5,066,059, Cl. 294-82.160.

Ziegler, Peter: *See*—
Honel, Michael; Ziegler, Peter; Sprenger, Walter; and Wendt, Wolfgang, 5,066,758, Cl. 528-45.000.

Zimmer, Inc.: *See*—
Crowninshield, Roy D.; and Hori, Roy Y., 5,066,304, Cl. 623-22.000.

Zink, Rudolf, to Ciba-Geigy Corporation. 2-dicarboximidefluorane or 3-dicarboximidefluorane compounds. 5,066,814, Cl. 548-407.000.

Zinner, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Optical sensor. 5,066,860, Cl. 250-349.000.

Zip-Pak Incorporated: *See*—
Tilman, Paul, 5,065,899, Cl. 221-305.000.

Zlobin, Mikhail N.; Metsik, Viktor M.; Nemarov, Alexandr A.; Permyakov, Georgy P.; and Taraban, Nikolai T. Flotation machine. 5,066,389, Cl. 209-170.000.

Zlotnik, Clifford, to Unsmoke Systems, Inc. Antimicrobial coating. 5,066,328, Cl. 106-18.320.

Zocco, George. Enclosed innerspring mattress cover and process for assembling same. 5,065,485, Cl. 29-91.100.

Zoller, Jon P.; and Norris, Jeffrey J., to ITT Corporation. Dual plunger switch. 5,066,841, Cl. 200-342.000.

Zolner, David: *See*—
Gehly, Joel C.; Zolner, David; and Szumigala, James M., 5,067,064, Cl. 362-277.000.

Zombik, Winfried; Theobald, Hans; Wolf, Bernd; Schuster, Ludwig; Hofmeister, Peter; and Kuenast, Christoph, to BASF Aktiengesellschaft. Substituted benzyl 2-phenyl-1-alk(en)ylcyclopropane-carboxylates and the use thereof for controlling pests. 5,066,673, Cl. 514-521.000.

Zopf, David W.: *See*—
Schanin, David J.; Moore, Russel L.; Bartlett, John R.; Namias, Charles S.; Zopf, David W.; Gill, Brian D.; Creary, Trevor A.; Corbin, Stephen S.; Matale, Mark J.; Ford, David F.; and Frank, Steven J., 5,067,071, Cl. 395-275.000.

Zotto, Anthony A.: *See*—
Raleigh, William J.; Thimineur, Raymond J.; and Zotto, Anthony A., 5,066,756, Cl. 528-32.000.

Zucker, Leo. Compatible and spectrum efficient high definition television. 5,067,017, Cl. 358-141.000.

Zurecki, Zbigniew; Hayduk, Edward A., Jr.; North, John G.; and Swan, Robert B., to Air Products and Chemicals, Inc. Method of producing titanium nitride coatings by electric arc thermal spray. 5,066,513, Cl. 427-37.000.

Zusmanovsky, Zinovy A. Device for treatment of sexual impotence in human males. 5,065,744, Cl. 128-79.000.

Zvonkovic, Josip, to Mahle GmbH. Cooled plunger piston for internal combustion engines. 5,065,706, Cl. 123-41.350.

ZYP Coatings: *See*—
Holcombe, Cressie E., Jr.; and Chapman, Lloyd R., 5,066,330, Cl. 106-287.340.

501 P.B. & S. Chemical Company, Inc.: *See*—
Clements, James L., 5,066,306, Cl. 8-109.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF NOVEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barnes, James M.: *See*—
Meyborg, Holger; Wagner, Kuno; Barnes, James M.; and Salzburg, Herbert, Re. 33,748, Cl. 521-176.000.

Bayer Aktiengesellschaft: *See*—
Meyborg, Holger; Wagner, Kuno; Barnes, James M.; and Salzburg, Herbert, Re. 33,748, Cl. 521-176.000.

Dow Corning Corporation: *See*—
Lee, Chi-Long; Juen, Donnie R.; Saam, John C.; and Willis, Robin L., Jr., Re. 33,749, Cl. 525-100.000.

Hans Oetiker AG Maschinen- und Apparatefabrik: *See*—
Oetiker, Hans, Re. 33,744, Cl. 24-20.00R.

Hartley, Dwight N.: *See*—
Hartley, Tyrus W.; and Hartley, Dwight N., Re. 33,747, Cl. 405-266.000.

Hartley, Tyrus W.; and Hartley, Dwight N., to Soli-Tech, Inc. Rigidification of semi-solid agglomerations. Re. 33,747, Cl. 405-266.000.

Ihara Chemical Industry Co., Ltd.: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, Re. 33,745, Cl. 71-90.000.

Integrated Tech Systems, Inc.: *See*—
Lucas, Gary H., Re. 33,746, Cl. 239-744.000.

Juen, Donnie R.: *See*—
Lee, Chi-Long; Juen, Donnie R.; Saam, John C.; and Willis, Robin L., Jr., Re. 33,749, Cl. 525-100.000.

Kambe, Takeshi: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, Re. 33,745, Cl. 71-90.000.

Katou, Susumu: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, Re. 33,745, Cl. 71-90.000.

Kumiai Chemical Industry Co., Ltd.: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, Re. 33,745, Cl. 71-90.000.

Lee, Chi-Long; Juen, Donnie R.; Saam, John C.; and Willis, Robin L., Jr., to Dow Corning Corporation. Storage stable heat curable organosiloxane compositions containing microencapsulated platinum-containing catalysts. Re. 33,749, Cl. 525-100.000.

Lucas, Gary H., to Integrated Tech Systems, Inc. Programmable sprinkler system. Re. 33,746, Cl. 239-744.000.

Meyborg, Holger; Wagner, Kuno; Barnes, James M.; and Salzburg, Herbert, to Bayer Aktiengesellschaft. Process for the preparation of polyurethane plastics using dianhydro-hexite diols. Re. 33,748, Cl. 521-176.000.

Oetiker, Hans, to Hans Oetiker AG Maschinen- und Apparatefabrik. Earless clamp structure. Re. 33,744, Cl. 24-20.00R.

Saam, John C.: *See*—
Lee, Chi-Long; Juen, Donnie R.; Saam, John C.; and Willis, Robin L., Jr., Re. 33,749, Cl. 525-100.000.

Salzburg, Herbert: *See*—
Meyborg, Holger; Wagner, Kuno; Barnes, James M.; and Salzburg, Herbert, Re. 33,748, Cl. 521-176.000.

Soli-Tech, Inc.: *See*—
Hartley, Tyrus W.; and Hartley, Dwight N., Re. 33,747, Cl. 405-266.000.

Wagner, Kuno: *See*—
Meyborg, Holger; Wagner, Kuno; Barnes, James M.; and Salzburg, Herbert, Re. 33,748, Cl. 521-176.000.

Watase, Yukihiro: *See*—
Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, Re. 33,745, Cl. 71-90.000.

Willis, Robin L., Jr.: *See*—
Lee, Chi-Long; Juen, Donnie R.; Saam, John C.; and Willis, Robin L., Jr., Re. 33,749, Cl. 525-100.000.

Yamaguchi, Mikio; Watase, Yukihiro; Kambe, Takeshi; and Katou, Susumu, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Thiadiazabicyclononane derivatives, processes for their production and herbicidal compositions. Re. 33,745, Cl. 71-90.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Hieftje, Gary M.; Honigs, David E.; and Hirschfeld, Thomas B., to Indiana University Foundation. Method and devices for near-infared evaluation of physical properties of samples. B1 4,800,279, 11-19-91, Cl. 250-339.000.

Hirschfeld, Thomas B.: *See*—
Hieftje, Gary M.; Honigs, David E.; and Hirschfeld, Thomas B., B1 4,800,279, Cl. 250-339.000.

Honigs, David E.: *See*—
Hieftje, Gary M.; Honigs, David E.; and Hirschfeld, Thomas B., B1 4,800,279, Cl. 250-339.000.

Indiana University Foundation: *See*—
Hieftje, Gary M.; Honigs, David E.; and Hirschfeld, Thomas B., B1 4,800,279, Cl. 250-339.000.

Kuethe, Arnold M., to University of Michigan, The. Boundary layer control of flow separation and heat exchange. B1 3,578,264, 11-19-91, Cl. 244-199.000.

University of Michigan, The: *See*—
Kuethe, Arnold M., B1 3,578,264, Cl. 244-199.000.

LIST OF DESIGN PATENTEES

ABC Group Product Development: *See*—
Elgner, Benno, 321,653, Cl. D9-434.000.

Abiney, Hassin A.: *See*—
Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger, 321,690, Cl. D14-191.000.
Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger, 321,691, Cl. D14-191.000.

Adams, William E. Ceiling hook. 321,639, 11-19-91, Cl. D8-373.000.

Aikawa, Masahiro, to Seikosha Co., Ltd. Clock. 321,656, 11-19-91, Cl. D10-6.000.

Aikawa, Masahiro, to Seikosha Co., Ltd. Clock. 321,660, 11-19-91, Cl. D10-10.000.

Airway Industries, Inc.: *See*—
Kim, Hyun S., 321,593, Cl. D3-71.000.

Aldred, T. Eric; and Council, Hal A., to Aldred, T. Eric. Powered lift for commode seat. 321,757, 11-19-91, Cl. D23-311.000.

Alliance Telecommunications Corp.: *See*—
Mailandt, Peter, 321,693, Cl. D14-234.000.

Alsup, J. Douglas: *See*—
Blount, Wendell G.; Lackey, Henry L.; Mosetich, Ronald J.; Peeples, Bedford F.; Kimbro, David L.; Saunders, William J.; Yard-

ley, Lloyd M.; Alsup, J. Douglas; and Crosby, Samuel C., 321,680, Cl. D13-103.000.
Ambasz, Emilio. Ball point pen with retractable cap. 321,718, 11-19-91, Cl. D19-48.000.
American National Can Company: *See*—
Cochran, Donald D., 321,651, Cl. D9-403.000.
Antibes, Inc.: *See*—
Li, Shing-Lam, 321,581, Cl. D2-244.000.
Arai, Takuya: *See*—
Ohmura, Hiroshi; and Arai, Takuya, 321,705, Cl. D16-208.000.
Armour, Patrick C. Suspended suction head for removal of free floating oil. 321,770, 11-19-91, Cl. D32-25.000.
Armstrong, Sandra L. Novelty torch. 321,672, 11-19-91, Cl. D11-157.000.
Armstrong, Timothy O.: *See*—
Dunham, Paul T.; Littrell, David J.; and Armstrong, Timothy O., 321,734, Cl. D21-192.000.
Arnold Kock GmbH u. Co. KG: *See*—
Cerny, Rudolf, 321,597, Cl. D5-55.000.
Cerny, Rudolf, 321,598, Cl. D5-61.000.
ASICS Corporation: *See*—
Hase, Yoshiaki, 321,587, Cl. D2-320.000.
Mitsui, Shigeyuki, 321,584, Cl. D2-277.000.
Aveni, Michael A., to Nike, Inc.; and Nike International, Ltd. Shoe upper. 321,586, 11-19-91, Cl. D2-314.000.
B.P.T. S.p.A.: *See*—
Plozner, Lisio, 321,686, Cl. D14-159.000.
Babcock, Lowell C.; and Bolger, Betty J. Combined comb and holder for permanent wave paper. 321,766, 11-19-91, Cl. D28-25.000.
Baker, Thomas G., Jr. Light timer. 321,667, 11-19-91, Cl. D10-40.000.
Barfield, Jesse. Golfing green insert for table. 321,616, 11-19-91, Cl. D6-491.000.
Beecham Group p.l.c.: *See*—
Buswell, John F.; Cracknell, Victor C.; and Khambatta, Noshir J., 321,759, Cl. D24-130.000.
Bengtson, Alan D.; and Davis, Robert S., to Kohler Co. Lavatory. 321,753, 11-19-91, Cl. D23-284.000.
Bennett, Richard P.: *See*—
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; and Bennett, Richard P., 321,724, Cl. D20-19.000.
Bennetts, John R. Airplane seat attachable bag. 321,594, 11-19-91, Cl. D3-77.000.
Beno, Steven J.; and Mango, Joseph R. Combined paper trimmer and dispenser with storage for office supplies. 321,715, 11-19-91, Cl. D18-34.000.
Berner, Suzanne M.: *See*—
Carlson, Linda S.; Doering, Kimberly J.; and Berner, Suzanne M., 321,731, Cl. D21-171.000.
Berwick Manufacturing, Inc.: *See*—
Palisin, Stephen P., Jr., 321,652, Cl. D9-429.000.
Bielawski, Billy J., Sr.: *See*—
Riera, John F.; Bielawski, Billy J., Sr.; and Pavelec, John J., 321,698, Cl. D15-141.000.
Blaustein, Lawrence A.; and Brown, Patrick W., to Tyco Industries, Inc. Ice cream maker. 321,697, 11-19-91, Cl. D15-82.000.
Blount, Wendell G.; Mosetich, Ronald J.; and Peeples, Bedford F. Powered invalid vehicle. 321,678, 11-19-91, Cl. D12-131.000.
Blount, Wendell G.; Lackey, Henry L.; Mosetich, Ronald J.; Peeples, Bedford F.; Kimbro, David L.; Saunders, William J.; Yardley, Lloyd M.; Alsup, J. Douglas; and Crosby, Samuel C. Battery case. 321,680, 11-19-91, Cl. D13-103.000.
Blubaugh, Jeffrey A. Physical exerciser. 321,735, 11-19-91, Cl. D21-195.000.
Boast, Rodney E.: *See*—
Merk, Eric E.; and Boast, Rodney E., 321,589, Cl. D2-320.000.
Bolger, Betty J.: *See*—
Babcock, Lowell C.; and Bolger, Betty J., 321,766, Cl. D28-25.000.
Boyd, David W.: *See*—
Gordon, Mark K.; and Boyd, David W., 321,605, Cl. D6-396.000.
Bradley, Andrew W., to Northern Telecom (Dublin) Limited. Telephone set. 321,685, 11-19-91, Cl. D14-143.000.
Braginetz, Paul A. Combined bottle and cap or similar article. 321,650, 11-19-91, Cl. D9-374.000.
Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger. Combined pager and magnetic key. 321,690, 11-19-91, Cl. D14-191.000.
Brenda, Beverly J.; Abiney, Hassin A.; and McDiarmid, Roger. Combined pager and magnetic key. 321,691, 11-19-91, Cl. D14-191.000.
Brennan, James W., to Sebel Furniture Limited. Theater seat. 321,600, 11-19-91, Cl. D6-362.000.
Brito, Ralph. Air gap anti-siphon valve. 321,748, 11-19-91, Cl. D23-235.000.
Brook Design Products Limited: *See*—
Logue, Alan V.; and Divers, William, 321,743, Cl. D23-388.000.
Brown, Jon R., to Highpoint Golf, Inc. Golf putter head. 321,738, 11-19-91, Cl. D21-219.000.
Brown, Patrick W.: *See*—
Blaustein, Lawrence A.; and Brown, Patrick W., 321,697, Cl. D15-82.000.
Buonito, Carman; and Shaw, Donald, to Integrated Plastics Limited. Christmas tree stand. 321,670, 11-19-91, Cl. D11-130.100.
Burgener, Eddy, to Roventa-Henex SA. Wristwatch and strap. 321,666, 11-19-91, Cl. D10-32.000.
Burleson, Larry. Game board. 321,725, 11-19-91, Cl. D21-22.000.
Burns, Marvin D., to Ransburg Corporation. Pressurized paint cup. 321,747, 11-19-91, Cl. D23-225.000.
Buswell, John F.; Cracknell, Victor C.; and Khambatta, Noshir J., to Beecham Group p.l.c. Syringe. 321,759, 11-19-91, Cl. D24-130.000.
Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 321,668, Cl. D10-40.000.
Cain, Ann S., to 'Totes', Incorporated. Umbrella handle. 321,592, 11-19-91, Cl. D3-12.000.
Canon Kabushiki Kaisha: *See*—
Yoshihara, Tsutomu; and Nezu, Shigeru, 321,711, Cl. D18-54.000.
Carlson, Casey L.: *See*—
Stumpf, William E.; Carlson, Casey L.; and Knape, Richard S., 321,618, Cl. D6-574.000.
Stumpf, William E.; Carlson, Casey L.; and Knape, Richard S., 321,619, Cl. D6-574.000.
Stumpf, William E.; Carlson, Casey L.; and Knape, Richard S., 321,620, Cl. D6-574.000.
Stumpf, William E.; Carlson, Casey L.; and Knape, Ricahrd S., 321,621, Cl. D6-574.000.
Stumpf, William E.; and Carlson, Casey L., 321,622, Cl. D6-574.000.
Carlson, Linda S.; Doering, Kimberly J.; and Berner, Suzanne M., to Hadit, Inc. Boss doll. 321,731, 11-19-91, Cl. D21-171.000.
Carney, Steven H., to Steven Hull, Inc. Orthopedic back support pillow. 321,760, 11-19-91, Cl. D24-190.000.
Casale, Antonio A.: *See*—
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; and Bennett, Richard P., 321,724, Cl. D20-19.000.
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; and Bennett, Richard P., to Nunzio's Pizza, Inc. Adjustable and retractable menu and order display unit for drive-in restaurants or the like. 321,724, 11-19-91, Cl. D20-19.000.
Casale, Nicola D.: *See*—
Casale, Frank R.; Casale, Nicola D.; Casale, Antonio A.; and Bennett, Richard P., 321,724, Cl. D20-19.000.
Cavicchia, Sergio, to Fratelli Guzzini S.p.A. Draining-board for dishes and cutlery. 321,771, 11-19-91, Cl. D32-55.000.
Cerny, Rudolf, to Arnold Kock GmbH u. Co. KG. Textile fabric. 321,597, 11-19-91, Cl. D5-55.000.
Cerny, Rudolf, to Arnold Kock GmbH u. Co. KG. Textile fabric. 321,598, 11-19-91, Cl. D5-61.000.
Cesaroni, William C.: *See*—
Dobson, William C.; and Cesaroni, William C., 321,625, Cl. D7-360.000.
Chan, Kwong-Chi. Multipurpose stationery kit. 321,637, 11-19-91, Cl. D8-105.000.
Chia, Peter. Hovercraft. 321,674, 11-19-91, Cl. D12-5.000.
Chiang, Raymond R. Tack cart. 321,773, 11-19-91, Cl. D34-17.000.
Ciciliot, Henry. Tamping block. 321,636, 11-19-91, Cl. D8-75.000.
Claxton, Bruce A.: *See*—
Siddoway, Craig F.; Richards, Scott H.; and Claxton, Bruce A., 321,692, Cl. D14-226.000.
Cochran, Donald D., to American National Can Company. Plastic oil bottle. 321,651, 11-19-91, Cl. D9-403.000.
Cockman, Haggie I. Combined sprinkler support and hose coupler. 321,746, 11-19-91, Cl. D23-221.000.
Colella, Anita L. Cover for an intravenous bag. 321,758, 11-19-91, Cl. D24-127.000.
Combi Co. Ltd.: *See*—
Takahashi, Takehiko; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 321,599, Cl. D6-333.000.
Cooper Industries, Inc.: *See*—
Marach, David R., 321,683, Cl. D13-173.000.
Costello, Charles P. Mountable pouch. 321,595, 11-19-91, Cl. D3-106.000.
Council, Hal A.: *See*—
Aldred, T. Eric; and Council, Hal A., 321,757, Cl. D23-311.000.
Cracknell, Victor C.: *See*—
Buswell, John F.; Cracknell, Victor C.; and Khambatta, Noshir J., 321,759, Cl. D24-130.000.
Crafford, Japie, to Snappi Holdings (Proprietary) Limited. Diaper fastener. 321,673, 11-19-91, Cl. D11-200.000.
Crocco, Carlo, to Montres Mom Fabrication S.A. Wristwatch and strap. 321,665, 11-19-91, Cl. D10-32.000.
Crosby, Samuel C.: *See*—
Blount, Wendell G.; Lackey, Henry L.; Mosetich, Ronald J.; Peeples, Bedford F.; Kimbro, David L.; Saunders, William J.; Yardley, Lloyd M.; Alsup, J. Douglas; and Crosby, Samuel C., 321,680, Cl. D13-103.000.
Crown Leisure Products, Inc.: *See*—
Saiger, Herbert C., 321,602, Cl. D6-379.000.
Daiwa Seiko, Inc.: *See*—
Kameda, Yasuhisa; and Shiozaki, Akihisa, 321,741, Cl. D22-141.000.
Naeki, Yoshihiro; and Matsubara, Teiji, 321,744, Cl. D22-142.000.
Dannenberg, Todd D.; and Poulson, Keith L., to Kohler Co. Shower Enclosure. 321,756, 11-19-91, Cl. D23-305.000.
Dannenberg, Todd D.: *See*—
Poulson, Keith L.; and Dannenberg, Todd D., 321,755, Cl. D23-305.000.
Danner Shoe Manufacturing Co.: *See*—
Merk, Eric E.; and Boast, Rodney E., 321,589, Cl. D2-320.000.
Dardashti, Shahriar. Wire shelving unit for canned goods. 321,609, 11-19-91, Cl. D6-408.000.
Davis, Robert S.: *See*—
Bengtson, Alan D.; and Davis, Robert S., 321,753, Cl. D23-284.000.
DC Comics Inc.: *See*—
Furst, Anton, 321,732, Cl. D21-87.000.

Divers, William: *See*—
Logue, Alan V.; and Divers, William, 321,743, Cl. D23-388.000.
Dobson, William C.; and Cesaroni, William C., to West Bend Company, The. Electric skillet. 321,625. 11-19-91, Cl. D7-360.000.
Doering, Kimberly J.: *See*—
Carlson, Linda S.; Doering, Kimberly J.; and Berner, Suzanne M., 321,731, Cl. D21-171.000.
Dunham, Paul T.; Littrell, David J.; and Armstrong, Timothy O., to Precor Incorporated. Low impact treadmill. 321,734, 11-19-91, Cl. D21-192.000.
Eastman Kodak Company: *See*—
Leonard, Bruce A.; Lyon, Ralph M.; and Hargrave, Jerry L., 321,704, Cl. D16-200.000.
Elgner, Benno, to ABC Group Product Development. Container panel. 321,653, 11-19-91, Cl. D9-434.000.
Ferenz, Richard: *See*—
Franklin, Irving H.; Franklin, Larry J.; Ferenz, Richard; and Gluck, Kurt M., 321,736, Cl. D21-200.000.
Ferrero Ardennes S.A.: *See*—
Ferrero, Pietro, 321,640, Cl. D9-318.000.
Ferrero, Pietro, 321,641, Cl. D9-318.000.
Ferrero, Pietro, to Ferrero Ardennes S.A. Container for confectionery products. 321,640, 11-19-91, Cl. D9-318.000.
Ferrero, Pietro, to Ferrero Ardennes S.A. Container for confectionery products. 321,641, 11-19-91, Cl. D9-318.000.
Fiore, Joseph F.; and Weyer, John C., Sr., to Rubbermaid Incorporated. Pitcher. 321,624, 11-19-91, Cl. D7-321.000.
Fixtures Manufacturing Corporation: *See*—
Kemnitzer, Ronald B., 321,617, Cl. D6-501.000.
Franklin, Irving H.; Franklin, Larry J.; Ferenz, Richard; and Gluck, Kurt M., to Franklin Sports Industries, Inc. Tabletop football goal and net. 321,736, 11-19-91, Cl. D21-200.000.
Franklin, Larry J.: *See*—
Franklin, Irving H.; Franklin, Larry J.; Ferenz, Richard; and Gluck, Kurt M., 321,736, Cl. D21-200.000.
Franklin Sports Industries, Inc.: *See*—
Franklin, Irving H.; Franklin, Larry J.; Ferenz, Richard; and Gluck, Kurt M., 321,736, Cl. D21-200.000.
Fratelli Guzzini S.p.A.: *See*—
Cavicchia, Sergio, 321,771, Cl. D32-55.000.
Frenkler, Friedrich F.; Ono, Masayuki; Suzuki, Akira; and Uchibori, Noritaka, to Seiko Epson Corporation. Printer for electronic computer. 321,714, 11-19-91, Cl. D18-54.000.
Fuji Photo Film Co., Ltd.: *See*—
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Wesolowsky, Charles L. Flush tank flapper valve. 321,749, 11-19-91, Cl. D23-236.000.
West Bend Company, The: *See*—
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Centre Technique Interprofessionnel des Fruits et Legumes: *See*—
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Masseron, Alain; and Grillet, Elisa, 7,715, Cl. 34.000.
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Masseron, Alain; and Grillet, Elisa, 7,715, Cl. 34.000.
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 19, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

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35.2	5,065,730
44.5	5,065,731
88	5,065,732

CLASS 125

39	5,065,733

CLASS 126

9 R	5,065,734
40	5,065,735
110 B	5,065,736
214 R	5,065,737

CLASS 128

11	5,065,738
20	5,065,739
24 EL	5,065,740
	5,065,741
	5,065,742
60	5,065,743
79	5,065,744
156	5,065,752
200.11	5,065,753
200.26	5,065,754
	5,065,755
204.18	5,065,756
205.12	5,065,745
205.24	5,065,746
207.14	5,065,757
402	5,065,758
419.0 PG	5,065,759
630	5,065,747
	5,065,748
653.5	5,065,760
660.03	5,065,761
	5,065,762
660.07	5,065,763
661.09	5,065,764
664	5,065,749
672	5,065,765
708	5,065,766
745	5,065,750
	5,065,767
760	5,065,768
772	5,065,769
774	5,065,770
831	5,065,751
835	5,065,771
836	5,065,772
876	5,065,773

CLASS 131

291	5,065,774
297	5,065,775
365	5,065,776
	5,065,777

CLASS 132

74.5	5,065,778

CLASS 134

7	5,066,335
22.12	5,066,336

CLASS 135

33.7	5,065,779

CLASS 136

202	5,066,337
244	5,066,338
253	5,066,339
258	5,066,340

CLASS 137

15	5,065,780
	5,065,781
39	5,065,782
68.1	5,065,783
116	5,065,784
185	5,065,785
202	5,065,786
315	5,065,787
505.18	5,065,788
513.5	5,065,789
514.5	5,065,790
515	5,065,791
580	5,065,792
625.24	5,065,793
883	5,065,794

CLASS 138

176	5,065,795

CLASS 139

300	5,065,796
448	5,065,797

CLASS 140

123.6	5,065,798

CLASS 141

39	5,065,799
67	5,065,800

CLASS 142

38	5,065,801

CLASS 144

2 R	5,065,802

CLASS 148

11.5 C	5,066,341
12.7 A	5,066,342
111	5,066,343

CLASS 152

543	5,065,803

CLASS 156

138	5,066,344
157	5,066,345
	5,066,346
159	5,066,347
164	5,066,348
166	5,066,349
187	5,066,350
212	5,066,351
265	5,066,352
300	5,066,353
414	5,066,354
612	5,066,355
623 R	5,066,356
643	5,066,357
647	5,066,358
651	5,066,359
660	5,066,360
663	5,066,361

CLASS 157

13	5,065,804

CLASS 160

23.1 5,065,805
36 5,065,806
206 5,065,807
231.2 5,065,808

CLASS 162

17 5,066,362
100 5,066,363
281 5,066,364

CLASS 164

61 5,065,809
76.1 5,065,810
460 5,065,811
480 5,065,812

CLASS 165

1 5,065,813
41 5,065,814
67 5,065,815
125 5,065,816
153 5,065,817

CLASS 166

60 5,065,818
245 5,065,821
248 5,065,819
291 5,065,820
295 5,065,822

CLASS 173

91 5,065,823
134 5,065,824

CLASS 174

50 5,066,832
52.4 5,066,831

CLASS 175

38 5,065,825
75 5,065,826
414 5,065,827

CLASS 177

139 5,065,828
5,065,829
263 5,065,830

CLASS 178

19 5,066,833

CLASS 180

55 5,065,831
117 5,065,833
197 5,065,834
5,065,835
245 5,065,836

CLASS 182

18 5,065,837
38 5,065,838
47 5,065,839
93 5,065,840

CLASS 184

6.18 5,065,841

CLASS 186

61 5,065,842

CLASS 187

1 R 5,065,843
17 5,065,844
89 5,065,845
127 5,065,846

CLASS 190

125 5,065,847

CLASS 191

40 5,066,834

CLASS 192

0.076 5,065,849
1.36 5,065,848
3.29 5,065,853
8 R 5,065,854
53 E 5,065,855
90 5,065,850
103 R 5,065,851

CLASS 198

392 5,065,852
419.3 5,065,856
457 5,065,857
493 5,065,858
499 5,065,859
848 5,065,860

CLASS 200

61.43 5,066,835
61.45 R 5,066,836
5,066,837
61.89 5,066,838
144 R 5,066,839
330 5,066,840
342 5,066,841
345 5,066,842
737 5,066,038

CLASS 203

042 5,066,365

CLASS 204

12 5,066,366
44.4 5,066,367
58 5,066,368
74 5,066,369
129.1 5,066,370
149 5,066,371
153.1 5,066,372
153.21 5,066,373
181.4 5,066,374
182.4 5,066,375
182.8 5,066,376
5,066,377
237 5,066,378
279 5,066,379
290 R 5,066,380
298.12 5,066,381
299 R 5,066,382
435 5,066,383

CLASS 206

63.5 5,065,861
151 5,065,862
210 5,065,863
278 5,065,864
409 5,065,865
455 5,065,866
494 5,065,868
542 5,065,867

CLASS 207

140.1 5,065,869

CLASS 208

45 5,066,384
131 5,066,385
187 5,066,386

CLASS 209

5 5,066,387
170 5,066,388
5,066,389
217 5,066,390

CLASS 210

85 5,066,391
96.1 5,066,392
136 5,066,393
169 5,066,394
198.2 5,066,395
236 5,066,396
321.61 5,066,397
321.89 5,066,398
401 5,066,399
493.5 5,066,400
500.35 5,066,401
636 5,066,402
638 5,066,403
670 5,066,404
693 5,066,405
744 5,066,407
765 5,066,408

CLASS 211

13 5,065,870
37 5,065,871
122 5,065,872
187 5,065,873

CLASS 213

31 5,065,874

CLASS 215

1 C 5,066,081
10 5,065,875
206 5,065,876
239 5,065,877

CLASS 219

10.55 R 5,066,843
85.16 5,066,844
119 5,066,845
121.63 5,066,846
124.34 5,066,847
5,066,848
233 5,066,849
388 5,066,850
400 5,066,851
544 5,066,852

CLASS 220

3.8 5,065,878
258 5,065,881
264 5,065,884
269 5,065,882
276 5,065,883
326 5,065,885
331 5,065,886
338 5,065,887
355 5,065,888
366 5,065,889
401 5,065,890
404 5,065,891
465 5,065,892
565 5,065,893
694 5,065,923
711 5,065,880
739 5,065,879

CLASS 221

25 5,065,894
54 5,065,895
73 5,065,896
130 5,065,897
171 5,065,898
305 5,065,899

CLASS 222

1 5,065,900
3 5,065,904
20 5,065,901
31 5,065,902
71 5,065,903
132 5,065,905
137 5,065,906
183 5,065,907
185 5,065,927
480 5,065,908
484 5,065,909
504 5,065,910
517 5,065,911
5,065,912
528 5,065,913
529 5,065,914

CLASS 223

89 5,065,915
91 5,065,916
113 5,065,917

CLASS 224

42.32 5,065,922
191 5,065,918
257 5,065,919
275 5,065,920
324 5,065,921

CLASS 225

46 5,065,924
78 5,065,925
93 5,065,926

CLASS 226

7 5,065,928

CLASS 227

19 5,065,929
130 5,065,930

CLASS 228

19 5,065,931
55 5,065,932
102 5,065,933
112 5,065,934

CLASS 229

40 5,065,935
101 5,065,936
117.13 5,065,937
125.08 5,065,938
151 5,065,939

CLASS 235

381 5,066,853

CLASS 238

334 5,065,940

CLASS 239

282 5,065,942
298 5,065,943
550 5,065,944
556 5,065,945
744 Re.33,746

CLASS 241

16 5,065,946
30 5,065,947
199.5 5,065,948

CLASS 242

35.5 R 5,065,949
43.2 5,065,950
46.21 5,065,951
71.1 5,065,952
74 5,065,953
107.7 5,065,954
198 5,065,955

CLASS 244

3.2 5,065,956
3.21 5,065,957
17.17 5,065,958
54 5,065,959
131 5,065,960
137.4 5,065,961
199 B1 3,578,264
234 5,065,962

CLASS 246

187 B 5,065,963

CLASS 248

51 5,065,964
99 5,065,965
146 5,065,966
161 5,065,967
205.1 5,065,968
282 5,065,969
311.2 5,065,970
330.1 5,065,971
345.1 5,065,972
362 5,065,973
476 5,065,974
545 5,065,975
549 5,065,976
692 5,065,977

CLASS 250

202 5,066,854
221 5,066,855
229 5,066,856
231.15 5,066,857
307 5,066,858
339 5,066,859
B1 4,800,279
349 5,066,860
370.09 5,066,861
393 5,066,862
474.1 5,066,863
484.1 5,066,864
572 5,066,865

CLASS 251

129.06 5,065,978
129.16 5,065,979
144 5,065,980
148 5,065,981
320 5,065,982

CLASS 252

8.75 5,066,413
8.8 5,066,414
48.2 5,066,409
54.6 5,066,412
68 5,066,410
70 5,066,411
90 5,066,416
135 5,066,415
171 5,066,417
172 5,066,418
174.11 5,066,419
313.2 5,066,420
373 5,066,421
511 5,066,422
516 5,066,423
518 5,066,424
546 5,066,425

CLASS 254

8 B 5,065,983
18 5,065,984

CLASS 260

413 5,066,427

CLASS 261

29 5,066,428

CLASS 264

0.5 5,066,429
2.1 5,066,431
4.3 5,066,436
8 5,066,430
28 5,066,432
29.2 5,066,433
37 5,066,434
40.5 5,066,435
46.5 5,066,437
56 5,066,438
69 5,066,440
103 5,066,439
118 5,066,441
154 5,066,442
171 5,066,443
5,066,444
176.1 5,066,445
242 5,066,446
290.5 5,066,447
334 5,066,448
406 5,066,449
504 5,066,450

CLASS 266

156 5,065,985
217 5,065,986
283 5,065,987

CLASS 267

149 5,065,988

CLASS 269

139 5,065,989
282 5,065,990
309 5,065,991

CLASS 270

39 5,065,992
49 5,065,993
55 5,065,994

CLASS 271

9 5,065,995
176 5,065,996
187 5,065,997
251 5,065,998
265 5,065,999

CLASS 272

70 5,066,000
5,066,001
93 5,066,002
134 5,066,003
5,066,004
136 5,066,005

CLASS 273

1.5 R 5,066,006
5,066,007
2 5,066,008
14 5,066,009
26 D 5,066,010
58 G 5,066,011
65 EF 5,066,012
84 R 5,066,013
110 5,066,014
243 5,066,015
249 5,066,016
344 5,066,017
5,066,018
348.1 5,066,019
408 5,066,020
421 5,066,021

CLASS 277

1 5,066,022
2 5,066,023
53 5,066,024
5,066,025
96.1 5,066,026
165 5,066,027
181 5,066,028
236 5,066,029

CLASS 280

92 5,066,030
221 5,066,031
304.1 5,066,032
414.1 5,066,033
428 5,066,034
441.1 5,066,035
615 5,066,036
732 5,066,037
741 5,066,039
756 5,066,040
772 5,066,041
806 5,066,042
808 5,066,043
815 5,066,044

CLASS 281

45 5,066,045

CLASS 283

70 5,066,046
86 5,066,047

CLASS 285

18 5,066,048
80 5,066,049
319 5,066,050
328 5,066,051
334 5,066,052
373 5,066,053

CLASS 290

1 R 5,066,866
53 5,066,867

CLASS 292

201 5,066,054
228 5,066,055
341.16 5,066,056

CLASS 293

121 5,066,057

CLASS 294

1.1 5,066,058
82.16 5,066,059
86.18 5,066,060

CLASS 296

97.1 5,066,061
97.22 5,066,062
100 5,066,063
146 5,066,064
165 5,066,065
181 5,066,066
197 5,066,067
221 5,066,068

CLASS 297

374 5,066,069

CLASS 299

37 5,066,070

CLASS 3.1

366 5,065,522

CLASS 301

108 TW 5,066,071

CLASS 303

9.75 5,066,072
92 5,066,073
97 5,066,074
113 5,066,076
113 R 5,066,075
114 R 5,066,077

CLASS 307

262 5,066,868
272.3 5,066,869
296.1 5,066,870
5,066,871
443 5,066,872
5,066,873
446 5,066,874
5,066,875
475 5,066,876
603 5,066,877

CLASS 310

68 C 5,066,878
90.5 5,066,879
156 5,066,880
213 5,066,881
217 5,066,882
323 5,066,884

CLASS 312

114 5,066,078
204 5,066,079
297 5,066,080

CLASS 313

309 5,066,883
340 5,066,885
404 5,066,886
414 5,066,887
512 5,066,889
564 5,066,888
585 5,066,890

CLASS 315

8 5,066,891
46 5,066,892
169.3 5,066,893
224 5,066,894
226 5,066,895
291 5,066,896
362 5,066,898

CLASS 318

135 5,066,897
568.16 5,066,902
807 5,066,899

CLASS 323

224 5,066,900
267 5,066,901

CLASS 324

96 5,066,903
127 5,066,904
133 5,066,905
142 5,066,906
158 P 5,066,907
158 R 5,066,908
5,066,909
166 5,066,910
207.18 5,066,911
224 5,066,912
226 5,066,913
309 5,066,914
318 5,066,915
338 5,066,916
5,066,917
452 5,066,918
538 5,066,919
544 5,066,920
639 5,066,921

CLASS 330

51 5,066,922
107 5,066,923
124 R 5,066,924
269 5,066,925
311 5,066,926

CLASS 331

1 A 5,066,927
57 5,066,929

CLASS 333

20 5,066,928
164 5,066,930
182 5,066,931
202 5,066,932
204 5,066,933
205 5,066,934

CLASS 335

172 5,066,935
255 5,066,980
295 5,066,936

CLASS 336

84 C 5,066,937

CLASS 338

22 SD 5,066,938

CLASS 340

310 R 5,066,939
453 5,066,940
457 5,066,941
568 5,066,942
573 5,066,943
603 5,066,944
784 5,066,945
787 5,066,946
815.31 5,066,947
825.44 5,066,949
825.69 5,066,948
937 5,066,950

CLASS 341

32 5,066,951
138 5,066,952
155 5,066,953
158 5,066,954
168 5,066,955

CLASS 342

154 5,066,956
352 5,066,957

CLASS 343

756 5,066,958
786 5,066,959

CLASS 346

76 L 5,066,962
76 PH 5,066,960
5,066,961
140 R 5,066,963
5,066,964

CLASS 351

221 5,066,116
226 5,066,117

CLASS 354

64 5,066,965
82 5,066,966
149.11 5,066,967
400 5,066,968
402 5,066,969
5,066,970
465 5,066,971

CLASS 355

27 5,066,972
5,066,973
71 5,066,974
200 5,066,975
5,066,976
201 5,066,977
206 5,066,978
208 5,066,979
233 5,066,987
245 5,066,981
5,066,988
269 5,066,982
270 5,066,989
297 5,066,983
309 5,066,984
326 5,066,985
5,066,986

CLASS 356

73.1 5,066,118
124 5,066,119
5,066,120
218 5,066,121
241 5,066,122
312 5,066,123
5,066,124
316 5,066,125
328 5,066,126
5,066,127
346 5,066,990
349 5,066,128
356 5,066,129
5,066,130
401 5,066,131
432 5,066,132

CLASS 357

13 5,066,991
23.5 5,066,992
23.7 5,066,993
24 5,066,994
42 5,066,995
43 5,066,996
45 5,066,997
51 5,066,998
5,066,999
53 5,067,000
54 5,067,001
59 5,067,002
68 5,067,003
71 5,067,004
72 5,067,005
74 5,067,006
5,067,007
81 5,067,008

CLASS 358

12 5,067,009
13 5,067,010
23 5,067,011
93 5,067,012
5,067,013
105 5,067,014
133 5,067,015
140 5,067,016
141 5,067,017
142 5,067,018
160 5,067,019
214 5,067,020
241 5,067,021
248 5,067,022
261.1 5,067,023
296 5,067,024
298 5,067,025
340 5,067,026
439 5,067,027
494 5,067,028
909 5,067,029

CLASS 359

43 5,066,104
45 5,066,107
54 5,066,109
5,066,110
58 5,066,105
59 5,066,106
65 5,066,108
152 5,067,173
213 5,066,083
5,066,084
267 5,066,112
275 5,066,111
361 5,066,082
457 5,066,099
540 5,066,098
569 5,066,100
570 5,066,133
630 5,066,102
638 5,066,101
649 5,066,113
665 5,066,114
676 5,066,115
823 5,066,103

CLASS 360

14.1 5,067,030
22 5,067,031
46 5,067,032
70 5,067,033
74.1 5,067,034
85 5,067,035
96.5 5,067,036
103 5,067,037
107 5,067,038
135 5,067,039

CLASS 361

19 5,067,044
56 5,067,045
220 5,067,046
361 5,067,043
384 5,067,040
5,067,047
394 5,067,041
406 5,067,042
540 5,067,048

CLASS 362

18 5,067,049
30 5,067,050
34 5,067,051
61 5,067,052
5,067,053
5,067,054
66 5,067,055
5,067,056
83.2 5,067,057
83.3 5,067,058
101 5,067,059
5,067,060
145 5,067,061
146 5,067,062
156 5,067,063
277 5,067,064
369 5,067,065

CLASS 363

16 5,067,066

CLASS 364

156 5,067,067
410 5,067,079
431.04 5,067,080
444 5,067,081
449 5,067,082
453 5,067,083
5,067,084
474.06 5,067,085
474.08 5,067,086
474.24 5,067,087
478 5,067,088
486 5,067,089
5,067,090
490 5,067,091
496 5,067,092
498 5,067,093
510 5,067,094
517 5,067,096
550 5,067,099
571.01 5,067,100
578 5,067,101
709.12 5,067,102
709.16 5,067,103

CLASS 365

185 5,067,108
189.05 5,067,109
189.07 5,067,110
189.08 5,067,111

CLASS 366

102 5,066,134
208 5,066,135
209 5,066,136
336 5,066,137

CLASS 367

43 5,067,112
50 5,067,113
81 5,067,114
99 5,067,115

CLASS 369

37 5,067,116
44.27 5,067,118
47 5,067,119
59 5,067,120
75.2 5,067,121
112 5,066,138
116 5,067,117
5,067,122

CLASS 370

58.1 5,067,123
5,067,127
60 5,067,124
79 5,067,125
112 5,067,126

CLASS 371

5.5 5,067,128
16.1 5,067,129
20.1 5,066,139
22.1 5,067,130
40.1 5,067,131
52 5,067,132
53 5,067,133

CLASS 372

6 5,067,134
83 5,067,135

CLASS 374

134 5,066,140
169 5,066,141
208 5,066,142

CLASS 375

1 5,067,136
14 5,067,137
77 5,067,140
81 5,067,138
86 5,067,139
97 5,067,141

CLASS 376

237 5,066,451
252 5,066,452
352 5,066,453

CLASS 378

99 5,067,142
110 5,067,143
146 5,067,144
198 5,067,145
199 5,067,146

CLASS 379

60 5,067,147
111 5,067,148
224 5,067,149
354 5,067,150
433 5,067,151

CLASS 380

10 5,067,152
23 5,067,153
25 5,067,154
5,067,155
46 5,067,156

CLASS 381

13 5,067,157
51 5,067,158
90 5,067,159

CLASS 382

1 5,067,160
5,067,161
5 5,067,162
6 5,067,163
15 5,067,164
19 5,067,165
37 5,067,166
46 5,067,167
53 5,067,168

CLASS 383

4 5,066,143

CLASS 384

117 5,066,144
463 5,066,145
473 5,066,146
585 5,066,147

CLASS 385

24 5,066,148
25 5,066,088
33 5,066,092
5,066,093
35 5,066,089
5,066,090
41 5,066,086
43 5,066,087
58 5,066,096
73 5,066,094
76 5,066,097
98 5,066,091
99 5,066,095
115 5,066,085
135 5,066,149

CLASS 392

406 5,067,169
461 5,067,170

CLASS 395

24 5,067,095
115 5,067,097
126 5,067,098
146 5,067,070
200 5,067,074
275 5,067,071
5,067,076
375 5,067,069
5,067,073
5,067,104
400 5,067,077
5,067,078
5,067,105
425 5,067,075
500 5,067,107
575 5,067,106
650 5,067,068
5,067,072

CLASS 400

157.3 5,066,150
605 5,066,151
621 5,066,152
5,066,153

CLASS 401

131 5,066,154
175 5,066,155
213 5,066,156
288 5,066,157

CLASS 402

4 5,066,158

CLASS 403

134 5,066,159
140 5,066,160
172 5,066,161
361 5,066,162

CLASS 404

10 5,066,163

CLASS 405

66 5,066,164
119 5,066,165
128 5,066,166
150.1 5,066,167
249 5,066,168
266 Re.33,747
284 5,066,169

CLASS 407

54 5,066,170

CLASS 408

1 R 5,066,171
5,066,172
59 5,066,173
79 5,066,174
231 5,066,175

CLASS 409

133 5,066,176
178 5,066,177
233 5,066,178

CLASS 411

34 5,066,179
103 5,066,180
383 5,066,181

CLASS 412

3 5,066,182
4 5,066,183

CLASS 413

5,066,184

CLASS 414

18 5,066,185
221 5,066,186
237 5,066,187
339 5,066,188
416 5,066,189
799 5,066,190

CLASS 415

35 5,066,191
112 5,066,192
201 5,066,193
223 5,066,194

CLASS 416

200 R 5,066,195
241 A 5,066,196

CLASS 417

18 5,066,197
54 5,066,198
63 5,066,199
5,066,200
222 R 5,066,201
228 5,066,202
318 5,066,203
413 5,066,204

CLASS 418

1 5,066,205
55.3 5,066,206
171 5,066,207

CLASS 419

42 5,066,454

CLASS 420

58.8 5,066,459
100 5,066,455
472 5,066,456
552 5,066,457
586 5,066,458

CLASS 422

7 5,066,460
16 5,066,461
56 5,066,462
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58 5,066,464
5,066,465
98 5,066,466
140 5,066,467
266 5,066,468

CLASS 423

150 5,066,469
242 5,066,470
319 5,066,471
342 5,066,472
344 5,066,473
479 5,066,477
541 R 5,066,474
622 5,066,475
648.1 5,066,476

CLASS 424

1.1 5,066,478
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47 5,066,481
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63 5,066,485
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85.8 5,066,491
85.91 5,066,490
89 5,066,492
121 5,066,585
122 5,066,493
448 5,066,494
451 5,066,495
570 5,066,496
616 5,066,497

CLASS 425

13 5,066,208
28.1 5,066,209
71 5,066,210
122 5,066,211
145 5,066,212
175 5,066,213
190 5,066,214
464 5,066,215
562 5,066,216
589 5,066,217

CLASS 426

2 5,066,498
19 5,066,499
20 5,066,218
72 5,066,500
74 5,066,501
75 5,066,502
234 5,066,503
417 5,066,504
438 5,066,505
450 5,066,506
481 5,066,507
584 5,066,508
592 5,066,509
607 5,066,510
658 5,066,511

CLASS 427

14.1 5,066,512
37 5,066,513
38 5,066,514
53.1 5,066,515
118 5,066,516
197 5,066,517
236 5,066,518
379 5,066,520
387 5,066,521
422 5,066,522
423 5,066,523

CLASS 428

15 5,066,524
29 5,066,525
35.2 5,066,526
35.6 5,066,527
36.92 5,066,528
40 5,066,529
98 5,066,530
131 5,066,531
137 5,066,532
156 5,066,533
196 5,066,535
212 5,066,534
216 5,066,536
246 5,066,537
288 5,066,538
328 5,066,539
336 5,066,540
378 5,066,541
412 5,066,543
461 5,066,542
614 5,066,544
626 5,066,545
627 5,066,546
5,066,547
629 5,066,548
653 5,066,549
670 5,066,550
690 5,066,551
694 5,066,552
698 5,066,553

CLASS 429

48 5,066,554
121 5,066,555
194 5,066,556
349 5,066,519

CLASS 430

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109 5,066,558
111 5,066,559
137 5,066,560
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169 5,066,561
203 5,066,562
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284 5,066,564
296 5,066,565
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325 5,066,567
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393 5,066,569
421 5,066,570
489 5,066,571
503 5,066,572
542 5,066,573
557 5,066,574
558 5,066,575
5,066,576
562 5,066,577

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280 5,066,221

CLASS 432

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160 5,066,229
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19 5,066,226
26 5,066,227
91 5,066,228
165 5,066,230
214 5,066,231
224 5,066,232

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188 5,066,233
205 5,066,234

CLASS 435

1 5,066,578
5 5,066,579
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7.24 5,066,581
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91 5,066,584
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172.3 5,066,588
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189 5,066,591
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240.27 5,066,593
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252.33 5,066,596
311 5,066,597
721 5,066,580

CLASS 436

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83 5,066,610
173 5,066,611
192 5,066,612
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229 5,066,615
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79 5,066,236
82 5,066,237
139 5,066,238
164 5,066,239
181 5,066,240
260 5,066,241
264 5,065,941
281 5,066,242
460 5,066,243
489 5,066,244
526 5,066,245
562 5,066,246
565 5,066,247
578 5,066,248
585 5,066,249
681 5,066,250
701 5,066,251
752 5,066,252
5,066,253

CLASS 440

72 5,066,254
112 5,066,255

CLASS 441

7 5,066,256

CLASS 445

26 5,066,257

CLASS 446

40 5,066,258
385 5,066,259
397 5,066,260

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57 5,066,261
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33 5,067,171
34 5,067,172

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96 5,066,263

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152 5,066,264
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CLASS 475

59 5,066,266
168 5,066,267
249 5,066,268

CLASS 493

183 5,066,269
435 5,066,270

CLASS 494

58 5,066,271

CLASS 501

1 5,066,637
3 5,066,619
21 5,066,620
41 5,066,621
87 5,066,622
97 5,066,623
107 5,066,624
127 5,066,618
5,066,625
128 5,066,626
134 5,066,617

CLASS 502

43 5,066,627
66 5,066,628
84 5,066,629
85 5,066,630
152 5,066,631
223 5,066,632

CLASS 503

209 5,066,633
5,066,634

CLASS 505

1 5,066,635
5,066,636
5,066,638

CLASS 512

13 5,066,639
21 5,066,640
25 5,066,641

CLASS 514

18 5,066,642
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19 5,066,644
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31 5,066,646
110 5,066,647
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183 5,066,649
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381 5,066,667
384 5,066,668
449 5,066,669
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453 5,066,671
513 5,066,672
521 5,066,673
529 5,066,674
544 5,066,675
562 5,066,676
563 5,066,677
597 5,066,678
618 5,066,679
622 5,066,680
716 5,066,681

CLASS 521

27 5,066,682
54 5,066,683
64 5,066,684
163 5,066,685
176 Re.33,748

CLASS 522

249 5,066,820

CLASS 523

102 5,066,686
205 5,066,687
415 5,066,688
5,066,689
423 5,066,690
438 5,066,691
458 5,066,692
466 5,066,693

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60 5,066,694
87 5,066,695
91 5,066,696
233 5,066,697
269 5,066,698
379 5,066,699
380 5,066,700
417 5,066,701
426 5,066,702
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449 5,066,704
457 5,066,705
459 5,066,706
490 5,066,707
504 5,066,708
516 5,066,709
555 5,066,710
556 5,066,711
563 5,066,712
591 5,066,713
731 5,066,714
812 5,066,715

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54.1 5,066,716
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84 5,066,718
92 5,066,719
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194 5,066,723
227 5,066,724
240 5,066,725
263 5,066,726
296 5,066,727
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127 5,066,739
160 5,066,740
171 5,066,741
215 5,066,743
216 5,066,742
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273 5,066,750
279 5,066,751
293 5,066,752
310 5,066,753
336 5,066,754
348.1 5,066,755

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45 5,066,757
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51 5,066,760
60 5,066,759
64 5,066,761
85 5,066,762
92 5,066,763
122 5,066,764
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193 5,066,767
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362 5,066,773
388 5,066,774
5,066,775
5,066,776
392 5,066,777
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481 5,066,780
5,066,781

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324 5,066,782
328 5,066,783
334 5,066,784
345 5,066,785
351 5,066,786
380 5,066,787
381 5,066,788
388 5,066,789
502 5,066,790

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1 5,066,795
106 5,066,426
140 5,066,796
215 5,066,797
225 5,066,798
226 5,066,799
471 5,066,800
523 5,066,801

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32 5,066,802
101 5,066,803
173 5,066,804
277 5,066,805

CLASS 546

180 5,066,806
183 5,066,807
250 5,066,809
300 5,066,810

CLASS 548

119 5,066,811
128 5,066,812
182 5,066,813
407 5,066,814

CLASS 549

319 5,066,815
331 5,066,816
384 5,066,817
389 5,066,818
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CLASS 558

389 5,066,822

CLASS 560

13 5,066,823
44 5,066,824
56 5,066,825
60 5,066,826
163 5,066,827
171 5,066,828
217 5,066,829

CLASS 600

9 5,066,272

CLASS 604

20 5,066,274
51 5,066,276
110 5,066,277
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5,066,280
5,066,281
152 5,066,282
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3 5,066,300
6 5,066,301
7 5,066,302
8 5,066,303
22 5,066,304
55 5,066,305

CLASS 800

230 5,066,830

D1—	116	321,580		440	321,613			321,645		131	321,678		54	321,707		141	321,741
D2—	244	321,581		475	321,614		337	321,646		196	321,679			321,708		142	321,744
	267	321,582		479	321,615		339	321,647	D13—	103	321,680			321,709	D23—	209	321,745
	277	321,583		491	321,616		341	321,648		108	321,681			321,710		221	321,746
		321,584		501	321,617		353	321,649		155	321,682			321,711		225	321,747
	314	321,585		574	321,618		374	321,650		173	321,683			321,713		235	321,748
		321,586			321,619		403	321,651	D14—	115	321,684			321,714		236	321,749
	320	321,587			321,620		429	321,652		143	321,685		D19—	36	321,717		241	321,750
		321,588			321,621		434	321,653		159	321,686			48	321,718		242	321,751
		321,589			321,622	D10—	2	321,655		165	321,687				321,719			321,752
		321,590	D7—	317	321,623		6	321,656		170	321,688			51	321,720		284	321,753
	627	321,591		321	321,624		7	321,657		188	321,689			59	321,721		292	321,754
D3—	12	321,592		360	321,625			321,658		191	321,690			64	321,722		305	321,755
	71	321,593		510	321,626		8	321,659			321,691		D20—	1	321,723			321,756
	77	321,594		596	321,627		10	321,660		226	321,692			19	321,724		311	321,757
	106	321,595		608	321,628		18	321,661		234	321,693		D21—	22	321,725		388	321,743
D4—	114	321,596		622	321,654			321,662	D15—	69	321,694			34	321,726	D24—	127	321,758
D5—	55	321,597		679	321,629			321,663		70	321,695			48	321,727		130	321,759
	61	321,598			321,630		30	321,664		72	321,696			64	321,728		187	321,761
D6—	333	321,599	D8—	10	321,631		32	321,665		82	321,697				321,729		190	321,760
	361	321,601		41	321,632			321,666		141	321,698				321,730	D26—	2	321,762
	362	321,600		70	321,633		40	321,667		149	321,699			87	321,732		37	321,763
	379	321,602			321,634			321,668	D16—	102	321,701			171	321,731		63	321,764
		321,603		71	321,635		44	321,669		104	321,700			191	321,733		138	321,765
	381	321,604		75	321,636	D11—	117	321,671		107	321,702			192	321,734	D28—	25	321,766
	396	321,605		105	321,637		130.1	321,670		112	321,703			195	321,735		64	321,767
	397	321,606		307	321,638		157	321,672		200	321,704			200	321,736	D30—	114	321,768
	407	321,607		373	321,639		200	321,673		208	321,705			201	321,737		132	321,769
		321,608	D9—	318	321,640	D12—	5	321,674	D18—	4	321,706			219	321,738	D32—	25	321,770
	408	321,609			321,641		85	321,675		34	321,715			238	321,742		55	321,771
	419	321,610		329	321,642		110	321,676		43	321,716		D22—	128	321,739	D34—	1	321,772
	433	321,611		333	321,643		117	321,677		49	321,712			133	321,740		17	321,773
	438	321,612			321,644													

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DESIGN PATENTS

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06 :	321,609		321,746	27 :	321,615		321,724		321,747	51 :	321,633
	321,610		321,749		321,618	36 :	321,629	41 :	321,583		321,650
	321,646	13 :	321,654		321,619		321,630		321,585	53 :	321,612
	321,677		321,757		321,620		321,664		321,586		321,672
	321,690	17 :	321,627		321,621		321,669		321,589		321,699
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	321,758	21 :	321,580		321,667		321,602	47 :	321,725		321,731
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	321,770	22 :	321,631		321,768		321,624		321,605		321,754
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PLANT PATENTS

06 :	7,716										

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